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Mrs. Chapin to Mrs. Chapman
Pros. R. Dent

Taking Impressions of the Mouth.

BY

JAMES W. WHITE, M.D., D.D.S.

FIFTH EDITION.

DENTAL LIBRARY
TORONTO

Taking the Bite.

By W. STORER HOW, D.D.S.

...gue of Impression Trays, Bite-...als, and Appliances.

...HITE DENTAL MFG. CO.,
PHILADELPHIA,
... CHICAGO, BROOKLYN, ATLANTA, ROCHESTER,
...OS AIRES, ST. PETERSBURG, TORONTO.

1900.

HIGH-GRADE PROSTHETIC DENTISTRY.

The Dentist's Part—The Manufacturer's Part.

By "high-grade prosthetic dentistry" is meant the practical recognition by the dentist in his product of the patient's rights in an artificial denture; his right to have every function of the natural teeth restored, so far as that is possible by prosthesis. The restoration of mastication and speech is but a small part of what is involved. The patient has an undoubted right to expect that the artificial denture for which he pays shall also measurably restore the normal appearance of the lower portion of his face; and that it shall not, by incongruities in the size, shade, or arrangement of the teeth, declare to the beholder, as clearly as though it bore a sign-board,—"These teeth are false."

We hear much of artistic dentistry, and sometimes the talk about it would lead one to think the term meant something hidden, or mystic, or abstruse,—beyond the power of ken of the average dentist. The true model for the prosthetic dentist is nature. Artistic prosthetic dentistry is the simulation of nature's handiwork in the human mouth. The shade, shape, size, and alignment of the teeth should so follow nature's models that the denture when completed shall harmonize with the other features of the patient for whom it was made. Anything less than this is a lowering of the ideal of the prosthetic dentist, an infraction of the patient's rights. On the other hand, the faithful following of nature's lead will inevitably produce the artistic denture.

The part of the manufacturer of dentists' supplies in the making of artificial dentures is much like that of the smith in the building of the Temple of Solomon. He supplies the tools with which all these men work. Upon his faithfulness depends, in large measure, the success or failure of the dentist's efforts. It does not pay him, in the long run, to sell the dentists poor Porcelain Teeth, "cheap" rubber, badly constructed or improperly tempered laboratory tools, dirty solders, or impure plate or wire, any more than it pays the dentist to use them. The manufacturer who does this may gather the "next dollar," but his business is not founded on the statesman principle, cannot endure in the confidence of his patrons. Speaking for ourselves alone, we have never pandered to the desire to buy "cheap" goods. Our business was founded on the belief that for the dentist as well as every one else, the "best is the cheapest." Our confidence that there would always be en[ough] to buy and use the best that could be made has been just[ified] uninterrupted expansion of our busine[ss] the knowledge that our products were [the] reality, has spread from the conviction w[ith] those products have grown in numbers. T[hey]

We offer a choice of at least twice as [many] facturer of Porcelain Teeth, represented by a[ll] 000 up. This, our first and principal product, l[eads] of the World's Premium Teeth. They have m[ade] no jot or tittle of the effort which put them in [the] abated to keep them well to the fore in quali[ty] always, the best combination of naturalness, str[ength] Base-Plate Rubbers we offer what has long bee[n] quality,—Bow-Spring. In Gold, Silver, and Platin[um] the distinction of uniformity of color and working q[ualities] given carat last year, so you find it to-day, and so y[ou] Our Solders are so smooth and easy-flowing that the[y] clean that you can see what they are doing all the tin[e] pliances, the trade-mark stands for the best that are

THE S. S. WHITE DEN[TAL]

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A Substitute for Molding Sand.

Suggested by Dr. A. D. Gritman.

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This compound is free from some of the objections to the various forms of Molding Sand. It does not require the care to keep it in good condition; is free from odor, both in the can and when having metal poured into it; does not become "lumpy" from use; does not dry out and require retempering when exposed to the atmosphere.

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Calcar is clean, sightly, and may be said to be always ready for use. It copies models exactly and smoothly in every detail. Models and dies may be cast in it with zinc, babbitt-metal, or any of the fusible alloys. Any style of flask may be used.

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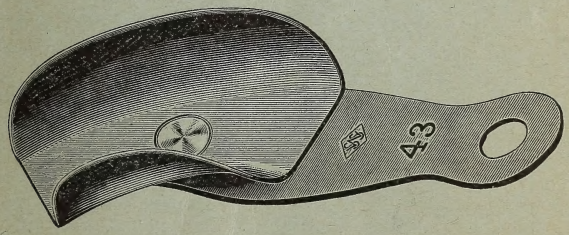
Calcar as sold has just moisture enough to work well. With little care it keeps in good condition for years. A tin can is a good receptacle to store it in. Whenever it begins to show a little dryness, a short exposure to the air will enable it to absorb sufficient moisture to restore its condition.

Put up in 2-qt. cans.

Price.....per can $0.30

BRIDGE IMPRESSION TRAY, No. 43.



This Tray, for partial impressions, is so constructed that the Tray has an independent swiveling motion, so that it can be adjusted to any angle, and can be applied to any portion of the mouth. It thus gives the functions of several trays in one appliance. The new Tray will be known as No. 43 of our line.

Price $0.20

TAKING IMPRESSIONS OF THE MOUTH.

BY

JAMES W. WHITE, M.D., D.D.S.

FIFTH EDITION.

TAKING THE BITE.

By W. STORER HOW, D.D.S.

To which is added a Catalogue of Impression Trays, Bite-Plates, Materials and Appliances.

THE S. S. WHITE DENTAL MANUFACTURING CO.,

PHILADELPHIA, NEW YORK, BOSTON, CHICAGO, BROOKLYN, ATLANTA, ROCHESTER, BERLIN, BUENOS AIRES, ST. PETERSBURG, TORONTO.

1900.

TAKING IMPRESSIONS OF THE MOUTH.

Preliminary Considerations.

There is probably no other department of dental practice in which so large a number of practitioners find themselves at times unsuccessful as in the taking of impressions of the mouth. It is hoped that in these pages, in the preparation of which advantage has been taken of all the available literature of the subject, practical hints are presented which will be of service, to beginners at least, in helping them to the attainment of better results in practice.

Importance of a correct impression.

A correct impression of the mouth is absolutely essential to the construction of a satisfactory denture. Without this to begin with, no subsequent care or skill can secure a good result, no matter of what material the base may be composed.

Conditions of the mouth.

The first thing to be considered is the character and condition of the mouth,—1, whether there are teeth remaining or not; 2, if so, their shape and position; 3, the character of the arch, large or small, deep or flat; 4, the ridge, irregular or smooth; 5, the state of the gums, if uniformly hard or soft, or hard in some places and soft in others, *e.g.*, ridge hard and palate soft, or ridge soft and palate hard.

If an artificial denture with a vacuum-chamber has been worn, or a plate or appliance of any kind has imbedded itself in the soft tissues, or caused irritation, it is well to have the patient dispense with its use for several days previous to taking an impression.

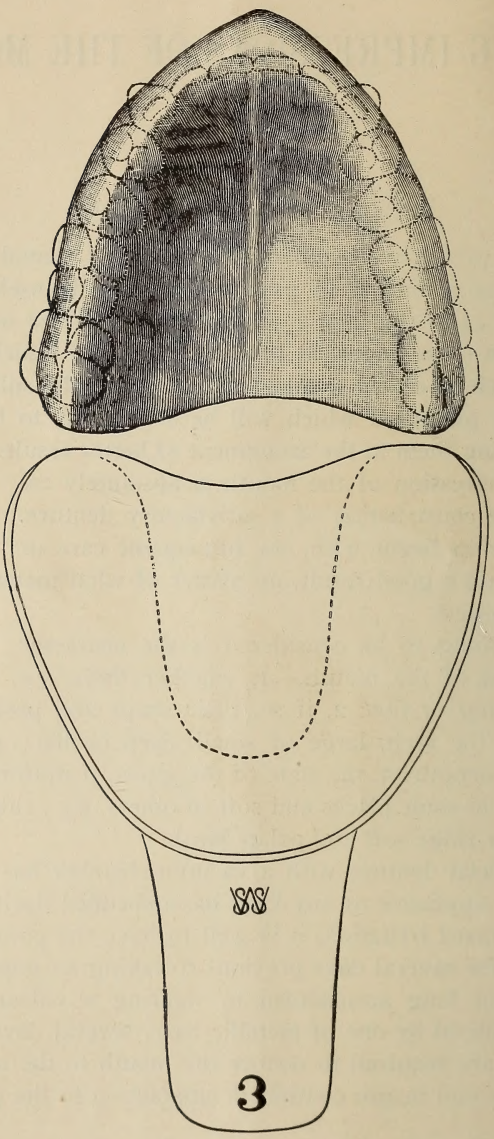
If a patient long accustomed to wearing a vulcanite denture desires it replaced by one of metallic base, several days and sometimes weeks are required to restore the mouth to the normal firmness of tissue and insure continued satisfaction to the patient.

Selection of the Tray.

Having ascertained all the difficulties to be overcome, the next step is to select a suitable tray with which to take the impression.

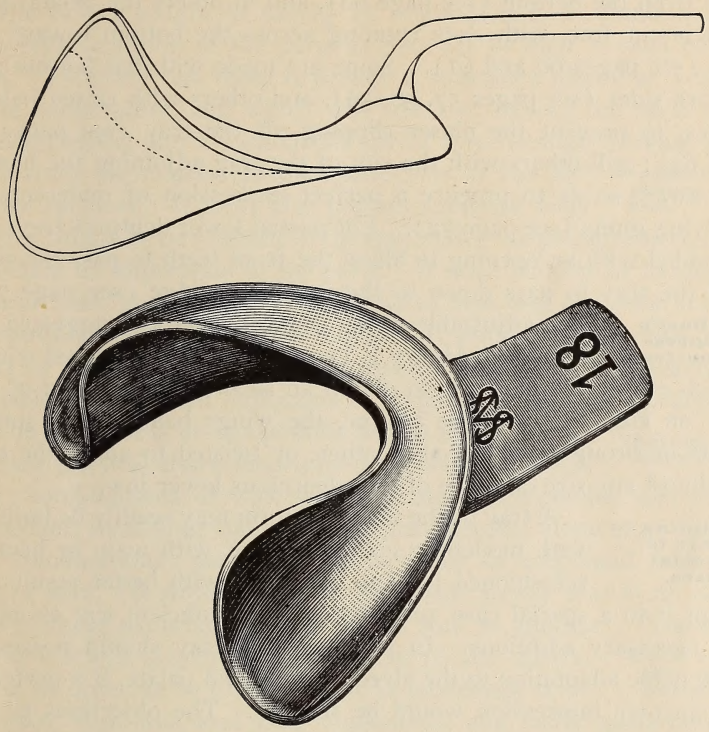
Shape and size of first importance.

This should be of such shape and size as will adapt it to the particular case in hand, and to the material to be employed. It should be large enough to em-



brace the alveolar ridge, leaving a space of an eighth to a quarter of an inch between its outer rim and the gum. The nearer within these limits it comes to fitting the mouth the easier will be its intro-

duction, less material will be required, with consequently less surplus to annoy the patient, less pressure is necessary, and the impression is likely to be more perfect. On the other hand, it must not fit too exactly; else *drawing* or stretching, if the impression be of wax, or comminute *fracture,* if it be of plaster, will be almost certain to occur. The proper size and shape should be determined by trial of the empty tray in the mouth.



Dr. Dorr's Impression-Tray.

The inferior jaw more difficult than the superior.

More care is required in the selection of a tray for the inferior than for the superior jaw, as, owing to the divergence of the former at the posterior part, and the extreme narrowness of the ridge, a slight variation will cause it to cut into the soft tissues and so become painful to the patient, besides preventing a correct impression. The tray should pass well back toward the rami of the jaw and cover the border completely. If teeth are remaining, a tray specially adapted to such cases should be used, either deep enough to receive them or with a portion of the tray cut out to permit their passage.

When teeth remain.

Trays for every need.

Adjustable trays.

A varied assortment of special trays of britannia metal is supplied by the manufacturers. These are adapted for entire or partial upper and lower cases, and for crown- and bridge-work; others adaptable to varying necessities, the shape and size being readily adjustable by bending or twisting to meet unusual presentations of the teeth, gums, or palatine arch. In some the side-walls are cut free from the bottom (see page 60), and in others the palatal portion is cut free, with slots running across the bottom toward the rim (see pages 60 and 61). Some are made with flat bottom and square sides (see pages 57, 58, 59), and others with raised palatal edges, to prevent the plaser slipping off the tray (see pages 62 and 63); still others with the rim of the tray adjoining the handle cut away, so as to procure a perfect impression of undercuts or shelving gums (see page 72). For partial lower dentures trays are provided with an opening to allow the front teeth to pass through, and the tray to pass down to the maxillary ridge (see page 74).

Dr. Dorr's impression-tray.

An adjustable lower impression-tray suggested by Professor Henry I. Dorr has posterior lingual wings, which enable the operator to obtain an accurate impression of the jaw on either side of the tongue, the wings being easily spread apart or brought toward each other, or twisted to adapt the tray to almost any size or shape of the edentulous lower jaw.

Adapting trays to special cases.

A tray of the ordinary form may readily be built up with modelling composition or with wax, or bent or refashioned in some instances with better results, to adapt it to a special case, provided it is of sufficient size to admit the necessary additions. In any case, the tray should possess a reasonable adaptation to the alveolar ridge and palate, if a perfectly satisfactory impression would be secured. The objections to the

Porcelain trays objectionable.

porcelain tray are that it cannot be modified to suit special cases, and is so smooth that the impression material may leave it and cling to the mouth. This latter objection may sometimes obtain with a new britannia tray, but in such case a little roughening of the surface will cause the

Tray leaving the impression in the mouth.

plaster to adhere. If in a special case it is desirable for the impression to remain in the mouth when the tray is withdrawn, it is only necessary to oil the metallic tray before putting the plaster in it.

A temporary expedient.

An emergency tray which will answer a very good purpose may be made by taking an impression in modelling composition or gutta-percha, and enlarging it to make

room for the impression material, either by cutting out or pressing with the fingers before it is perfectly hardened.

Selection of Impression Material.

Having decided upon the tray to be used, the next question to determine is the material to be employed.

The object sought in taking an impression is to obtain a correct representation of the parts as they are in their normal condition. To effect this there is needed a substance plastic at a moderate temperature, and which will admit of having the parts concerned pressed into it without the use of force enough to cause pain or *disturb the relative position and form of the different surfaces.* It must also possess sufficient body or consistence to be retained in the tray under the pressure necessary to obtain an impression of the parts. It must solidify or harden in a brief time, and under conditions as to heat and moisture not incompatible with those of the mouth. It must not materially contract or expand in cooling or hardening, and should as nearly as possible be free from objections as to taste, smell, and appearance.

Necessary properties.

The substances or compounds in use differ widely in their physical characteristics,—wax, white and yellow; combinations of wax with paraffin, gutta-percha, and other materials; modelling composition; gutta-percha, alone or in different combinations; plaster of Paris, alone or conjoined with the use of wax. It would doubtless be unsafe to say that in all cases one of these materials will answer as well as another. Plaster of Paris is more largely used than any of the others. Next in order as to extent of use is modelling composition, then wax and wax compounds, and lastly gutta-percha. A knowledge of the distinctive properties and applications of each is advisable.

Various materials.

Their relative importance.

When it is desired to displace soft parts to obtain a uniform bearing for a denture, the absence of elasticity in wax is considered an advantage. If an exact copy of the parts as they present is wanted, the impression to be subsequently carved to displace soft parts to adapt it to the requirements of the denture, plaster of Paris is the most desirable material for taking the impression.

Some special advantages of wax and plaster.

A metallic plate struck up on a zinc die is smaller than the mouth from which the impression was taken, by reason of the shrinkage of the zinc in cooling,—

Shrinkage and expansion set off.

unless this shrinkage is compensated for by the enlargement of the sand impression in the removal of the mold; a vulcanite plate is larger than the mouth, because of the expansion of the cast,—unless this expansion is counteracted by the shrinkage of the material in vulcanizing; consequently the compression made by the force required, in taking an impression in wax, or the contraction of gutta-percha, may be made to serve a useful purpose. It is evident, therefore, that no definite rule can be given applicable to all cases; very much must be left to the judgment of the operator. It is frequently difficult to decide in advance which is the best material for a given case; experiment alone can decide.

Wax for beginners. In the following pages the use of wax is treated of first, because it is the material which is usually chosen by beginners, on account of the ease with which it is manipulated, and also because the general directions for its employment are alike applicable in the use of other impression materials.

Difficulties to be Overcome.

Nausea and its prevention. In cases of irritable fauces, inducing nausea, it has been recommended to lessen the irritability by previously gargling with a strong solution of tannin, or potassium bromid, or with camphor-water; others have recommended that the fauces be accustomed to the presence of a foreign body, by passing the feather end of a quill over the parts a few times before taking the impression, or by directing the patient to manipulate the parts frequently with a spoon a few hours previous to the impression being taken. Such manipulation will, however, sometimes cause nausea and vomiting, especially if practiced soon after taking a meal. Others consider that the surest way to prevent retching is to force the patient's chin well down upon the breast, after the tray is in place, and so retain it until the impression is removed. Some direct the patient to place the tongue upon the posterior portion of the tray, and retain it in that position. The act of swallowing is likely to produce a sensation of nausea by bringing the soft palate into contact with the foreign body; the patient should therefore be advised to avoid swallowing during the operation. Nausea is frequently induced by the tray extending too far back in the median line (a fault with many of the trays as now made), and by the *use of too large a quantity of impression material.* In cases of extreme sensibility of the mucous membrane to contact with any impression material, a 2 per cent. solution of cocain applied carefully and lightly over the soft palate is said to have proven satis-

factory. In like cases the administration of a few inhalations of nitrous-oxid gas has effected good results.

Insertion of the tray.

The insertion of the tray may seem a trifling matter to the operator, but it is frequently not so to the patient. Few lips will admit an impression-tray direct without an amount of stretching at once inconvenient and painful; and in some cases, to secure a correct impression without subjecting the patient to serious discomfort, will require much care and expertness on the part of the operator. Unusual width of the jaw is not infrequently associated with a contracted commissure, and in addition, the muscles of the mouth may be rigid and unyielding. Another difficulty is in the common attempt of the patient *to open the mouth wide in an effort to assist the operator.* The patient should be directed to allow the jaw and the lips to be entirely under the control of the operator, who, standing partly to the right of and behind the patient, should present the tray obliquely, one side resting against and pressing outward one corner of the mouth, the opposite corner being extended with the first and second fingers of the left hand; the tray should then be passed in with a rotary movement to bring it into line. No more impression material should be used than enough to take the impression without overrunning the tray, and so increasing its width, under which circumstances the impression would be squeezed out of shape during its withdrawal from the mouth.

Let the operator control.

Beeswax.

Advantages of and objections to wax.

The special advantages of wax are that it is easily manipulated, is inelastic, and contracts but very slightly in cooling. The difficulties are these: The pressure required forces all the soft parts out of normal position, and renders a perfect impression of some mouths with wax impossible; the tendency to distortion of its form in withdrawing is also a serious objection to its use. It does not give as delicate a result as plaster, but is still preferred by some operators.

When wax is used, either a *pure* article should be obtained, or that which has been judiciously combined with a foreign substance for this specific purpose. Commercial adulterations with tallow, resin, vegetable wax, etc., injure it, making it difficult to manage. White wax has this advantage over yellow: it does not so easily draw out of shape, consequently the impression is less liable to distortion. It takes a sharper impression than the yellow, but it is more difficult

Difference between white and yellow wax.

to bring to the required plasticity, and more force is required to obtain a correct impression unless it is made hot. In summer-time the additional hardness is in its favor.

Scrap wax. Scrap wax of either variety should never be used without remelting, as it is difficult, if not impossible, to get it into a homogeneous mass.

Paraffin in wax. Paraffin is frequently added to wax, and this makes a compound plastic at a lower temperature than pure wax, either white or yellow. A small proportion improves it, especially for use in cold weather; but if in excess, it causes the wax to separate into layers, which are not easily reunited. It takes a sharper impression than wax alone, with less liability of drawing out of form; the addition of the paraffin in proper quantity causing the composition to be harder when cold than the wax alone.

Wax and gutta-percha. A combination of wax and gutta-percha is used, and highly prized by some, on account of its toughness. The objection to it is, that it is sticky. It may adhere to the plaster in making a model unless previously varnished.

Having decided to use wax of either variety or combination, examine the mouth and position of the remaining teeth, in order that a proper tray may be selected and introduced and withdrawn in a line with their axes without dragging.

High vault. In case of a high arch, select a tray adapted to it, or pile up the wax in the tray to correspond with the form of the mouth. For such cases, some operators cut a piece from the central portion of the tray, large enough to admit the finger, and thus force the wax into the deeper portions of the arch. The practice of others is to dry the mouth with a napkin, and then fill the palatine arch with soft wax, down to a point nearly on a line with the alveolar border, keeping the surface of the wax dry, and over this applying the impression-tray with the wax quite soft, thus obtaining a perfect impression.

Softening the wax. Bring the wax to a plastic state either by dry or wet heat, being very careful in either case not to overheat it, or produce the peculiar whitish appearance which precedes melting; the wax is injured if heat enough is used to liquefy the surface. Water will soften the wax more thoroughly, and it can thus be worked up without adhering to the hands, which is an annoyance in the use of dry heat.

Wet and dry heat. An objection, however, to the use of water is, that more or less moisture is worked into the wax, destroying to some extent its tenacity. A dry heat makes it tougher, but more care is required

to prevent it from being overheated. If water is used, a large bowl, with plenty of water, is desirable to secure uniform heating, and a thermometer should determine the temperature. Less than 120° F. will not suffice to make it as plastic as it should be; over 130° F. will cause it to become too adhesive. A better condition of the wax will be secured if it is allowed to heat up with the water. Of the two methods, there can be no doubt that careful dry heating will produce the better impression; moreover, the wax will not be liable to leave the tray and remain in the mouth, as it sometimes does when wet heat has been employed. Whether dry or wet heat is used, the wax must be thoroughly worked until the entire mass is plastic throughout. Some operators soften the wax with warm water; subsequently absorbing the moisture by working in a dry napkin, and then bringing to the desired plasticity with dry heat. This plan will save time when the wax is in mass.

Dry heat the better.

Combining wet and dry.

It has been recommended that the operator should be governed by the condition of the mouth with reference to the softness of the wax. Where the gums are uniformly spongy, the wax should be made quite soft; but in cases where the maxillary ridge in front is soft and yielding, it is well to have the wax fairly hard, so as to press it as closely as possible without folding the soft ridge, otherwise the pressure in biting will force tne plate up, and make it cant or rock on the hard palate.

Soft or hard, according to the condition of the mouth.

Preparation of the Mouth.

Direct the patient to rinse the mouth with warm water before taking the impression, to remove the mucus. Wiping the teeth with a pledget of cotton carrying a little glycerol, sweet oil, or vaselin, proves a useful preliminary to an impression with any material. When the wax is in a soft, plastic state, it should be immediately placed in the tray, which is previously heated to secure adhesion, avoiding the use of too large a quantity (the usual error of beginners); the surface warmed, and promptly inserted in the mouth, care being taken to secure the proper position of the tray with reference to the ridge, so that no portion of the rim may cut into the soft tissues; it should then be gently but steadily forced up against the parts (passing the finger around the outside of the tray to permit the rim to pass up between

Impression of the superior jaw.

Avoid too much wax.

Secure proper position of tray.

the cheeks and gums without drawing the mucous membranes) until the ridge is completely imbedded, and the wax closely pressed against the palatal surface, and held there for a few moments to allow it to cool and harden. To insure uniform pressure the tray should be held steadily and firmly, with two or more of the fingers of each hand on the under surface at about the position of the first bicuspids, the operator standing partly to the right of and behind the patient.

Imbed ridge completely.

Hold tray steady.

It is better to have the sides of the tray high enough to give the wax support at all points; but if any is pressed above the edges, it should be brought into contact with the gums by pressure of the finger against the cheeks and lip, so as to insure the filling of all depressions, irregularities, or interdental spaces. Special care should be observed in cases having a prominent ridge. The wax extruding at the palatal edge of the tray should be pressed back into the vault with the finger. The wax must be kept in the mouth long enough to cool and harden. To facilitate the hardening process, cloths dipped in ice-water, or a thin piece of ice wrapped in a napkin, may be applied to the under side of the tray, though there is some risk that the sudden reduction of the temperature of one side may cause unequal contraction. If too much wax has been used, and the impression is injured thereby, trim off the surplus, dip into warm water, and introduce it a second time; this plan will not answer so well, however, in partial cases, as the teeth will not enter precisely where they belong in the impression. If the natural teeth have been recently extracted, the wax should be quite soft to avoid pressing the soft tissues out of place.

Must cool before withdrawal.

How to cool the impression.

Surplus wax.

Great care is necessary in withdrawing the impression. The partial adhesion by atmospheric pressure tends to draw the wax out of shape, as does also that produced by the adherence of the wax between the approximal surfaces of the teeth; the impression-tray must therefore be held perfectly firm, allowing no vibration in any direction until clear of the teeth. If the attempt be made to draw it forward, the wax will be forced out of form by the lips of the patient when the mouth is opened too wide, and the impression rendered proportionately imperfect. Care must also be taken to have the tray sufficiently depressed to avoid abrasion by the teeth in its removal, the patient being instructed not to open the mouth too much, as by so doing the width

Care in withdrawal.

is contracted, and there is liability that the impression may be distorted in passing it through the lips.

Withdrawing adherent impression.

If the impression should adhere tightly to the mouth, as is sometimes the case, its removal may commonly be effected by lifting away the tissues of the cheek, or lip, or by directing the patient to give a slight cough, or to blow through the mouth, which admits air, and so breaks up the atmospheric pressure; or, preferably, by *having a hole in the center of the tray, through which a blunt instrument may be passed up to the palate.* Any little displacement of the wax which may be caused by the passage of the instrument will not be objectionable, because it will be in the spot where the vacuum-chamber is required.

Immediately on the removal of the impression, it should be put into a bowl of cold water, or held under the stream of a hydrant, in order to restore its normal hardness, and thus lessen the liability to a change of its shape from handling.

Impression of inferior jaw.

To take an impression of the inferior ridge, a tray adapted to the case in hand having been selected, it should be filled flush with its margins, and introduced in the same manner as directed for impressions of the upper jaw, the operator standing either behind and to the right of the patient or in front. If behind, pressure should be made upon the tray with the thumbs about over the position of the bicuspids; counter-pressure with the fingers under the jaw. If the position of the operator is in front, two fingers of each hand should make pressure upon the tray, while the counter-pressure should be made with the thumbs beneath the jaw, which may be protected by a folded napkin. It is important to draw out the cheeks before making pressure upon the tray, as the soft tissues are apt to overlap the posterior margin of the alveolar border. The patient ought then to be requested to thrust the tongue out of the mouth as far as possible, so as to free the soft tissues from entanglement. Firm and steady pressure should thus be made, until the ridge is entirely imbedded, when the wax should be pressed around the margin of the tray into all irregular surfaces or depressions, especially against the overhanging ridge at the angles of the jaw. Wax protruding along the lingual margins of the tray may be manipulated by the tongue of the patient.

Pressure and counter-pressure.

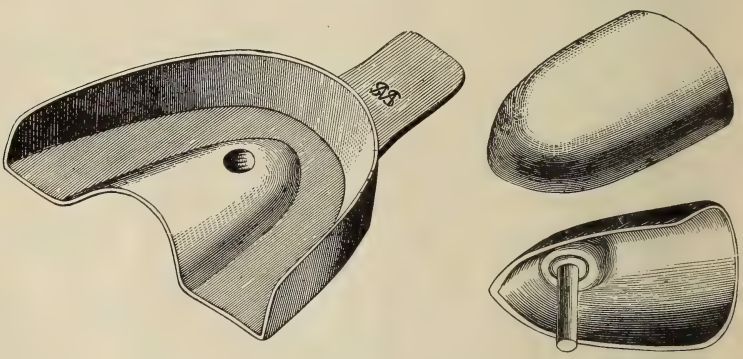
Dr. T. Wardle's tray.

Dr. Thomas Wardle invented a tray, which he brought to the notice of the profession many years since, and which is still used by some operators, for taking impres-

sions in wax, either for partial or full dentures. This tray was designed principally to overcome two obstacles in the way of obtaining a correct impression, viz: in cases requiring a partial plate, in which the shape of the crowns of the remaining teeth prevented an accurate impression at the necks; and also in cases in which a contracted and high arch made it difficult to obtain an impression with the ordinary tray.

Movable palate plates. This tray is supplied with movable palate plates, so adjusted as to be capable of forcing the center of the wax up against the highest part of the arch, as well as laterally against the palatal sides of the necks of any remaining teeth, thus securing an exact impression of the parts within the alveolar border.

In the use of this appliance, a suitable palate plate having been selected and placed in position, the tray is filled with wax, inserted in the mouth, and an impression secured as with an ordinary tray.



Then—great care being taken not to permit the tray to be removed from its position—with a *stout* plugging instrument, pressure should be made against the projecting end of the bar of the palate plate until it will yield no further, taking care that the body of the tray is not forced from the ridge.

Modelling Composition.

Composition and qualities. This material is composed of gum copal, stearin, and French chalk. When of a good quality it takes a very sharp impression, and is adapted to cases of irregularly placed or bell-crowned teeth, wedge-shaped spaces, or where the teeth incline inward, and in cases of overhanging ridge; its elasticity at a certain stage of cooling causing it to regain its original form after displacement in the act of withdrawal. By judicious

Impressions of irregular teeth and overhanging ridge.

manipulation it can be made serviceable in displacing soft tissues where such a result is desired.

Used much the same as wax.

The general directions as to the employment of wax are applicable to the use of modelling composition, and trays such as are adapted for taking impressions in wax are suitable also for use with this material.

Special directions.

The directions for its use are to bring water to the boiling-point in an open vessel; remove from over the flame and put in the composition, which when soft take out with a spatula or spoon, and knead with wet hands into shape to fit the impression-tray, which should be previously warmed. Pass through the flame to glaze the surface, and place at once in the mouth. Hold steady a half-minute; push the lips and cheeks in firmly, and with the finger in the mouth press against the palatal or lingual parts. When properly cooled, carefully remove from the mouth and plunge into cold water, *allowing it to remain there until hard.*

To determine when to remove from the mouth.

To determine when the impression should be removed is a matter requiring some experience and judgment. A test of its condition may be obtained by pressing the finger-nail into any protruding portion, and observing the degree of hardness.

To remove from tray.

Hardened modelling composition may be detached by tapping the tray with a light hammer. Treated in this manner, the composition leaves the tray as clean as before using.

The whole secret of the successful manipulation of modelling composition lies in working it at such a degree of softness as will carry it beyond its contractile condition, and in making discriminating use of its elastic properties.

Gutta-Percha.

Advantages and objections.

Gutta-percha has been extensively used, and is still esteemed, by some, for special cases. When of good quality, it will take a sharp and delicate impression. The objections to its use are that the degree of heat required to make it plastic is painful to some patients; it is liable to change its shape when withdrawn from the mouth, and it has a tendency to contract very decidedly in cooling. Various suggestions have been made to improve it as an impression-material by combining it with other substances, such as magnesia, or chalk. In such combinations it

Properties and changes in combination.

Gutta-percha and chalk. becomes harder when cold, is less sticky when warm, and less liable to contract in the process of cooling. It will take slight undercuts, and, in consequence of its elasticity, with less dragging than wax, but is apt to pass into narrow spaces between the teeth, and the force required to dislodge it injures the impression.

One great cause, perhaps, of the difference in the estimate of its value by different practitioners, is in variations in the quality of the article used. It is liable to undergo a marked change by exposure to the air, losing its toughness and elasticity; it is then very brittle when cold, and exceedingly sticky when warm. If of good quality, it is easily made plastic by wet heat without sticking to the fingers; if it will not bear this test, it is not fit for use in taking impressions.

Degenerative changes.

Test for quality.

Tray for gutta-percha. For taking impressions in gutta-percha, the tray should approximate the size and shape of the mouth, so as to distribute the material evenly, and not leave in one part or another a superfluous thickness to cause irregular contraction in cooling, and drawing or sucking in the act of withdrawing it. It should be well worked, and freed from bubbles; after which manipulation the surface should be dried, and the mass held for a few moments over a spirit-lamp, and put into a previously warmed tray. This will cause it to adhere to the tray, and prevent withdrawal from the sides of it, in cooling. If it is desired to take advantage of its property of contracting, it may be dipped again in the water when ready for the tray, which ought also to be wet and cool.

Method of use.

Cooling for removal. While the impression is still in the mouth, the surface of the tray may be cooled with ice, or a sponge dipped in ice-water; but if the impression is a thin, delicate one, there is danger that the sudden cooling of one side may cause unequal contraction. Care should also be used not to make it too hard, when there are dovetail spaces between the teeth, or when the teeth themselves are wedge-shaped or conical. A little plaster batter pressed with the end of the finger into the spaces between the teeth, and allowed to set, will prevent wax or gutta-percha from entering. After the impression is taken, the plaster can be removed with an excavator and returned to its proper place in the impression. It is well to dip the impression into cold water immediately upon its removal from the mouth.

One operator teaches that excellent results may be obtained by the proper manipulation of gutta-percha, which consists in dipping thin sheets of it in boiling water; taking them out on a glass rod; dipping them into cold water; then filling the tray and placing it in hot water for half a minute; dipping once more into cold water, and promptly introducing the tray into the mouth. He directs that it should remain in the mouth until it is found by testing with the finger-nail that it is just cold enough to spring back into place if moved.

Another method.

No oil or other substance should be put upon a gutta-percha impression before filling with plaster. To remove the impression from the plaster model, it should be put, when the plaster is hardened, into water, of temperature from 190° to 200° F., and allowed to remain until the gutta-percha is thoroughly softened.

To remove from plaster cast.

Plaster of Paris.

This material has been for many years in general use for taking impressions, and its merits are fully established. It requires nicer manipulation, and is not so cleanly as wax; but the results are so nearly certain, with proper manipulation, that they counterbalance any inconveniences attending its use. It readily conforms to the minutiæ of shape and irregularities of the parts to be taken, and if broken presents clean, sharp, well-defined fractures which permit accurate replacement; the pieces being retained in place by a little melted wax dropped upon the lines of fracture on the outside of the impression.

Advantages.

A question has been raised in regard to the expansion of plaster in the process of recrystallization or setting. That it does expand is admitted, but only about $\frac{1}{500}$ of its own measure, which is not sufficient to interfere materially with the success of an artificial denture. It is claimed, and if true it is a curious fact, that it expands less or not at all when salt or potash-alum has been added.

Expansion of plaster.

Plaster of Paris is chemically a native sulfate of lime, found in great abundance in many parts of the world. In its crude state it is called gypsum, and is prepared for use by being reduced to a fine powder, and subsequently calcined in ovens at a temperature between 300° and 400° F. When pure, properly ground, and calcined, if mixed with water, a chemical union takes place, which is commonly called a "setting." This chemi-

Nature and preparation.

Factors which control "setting."

cal action liberates latent heat, with a consequent elevation of temperature. If overheated in the calcining process, it parts with all of its water, and fails to recrystallize when mixed with water. This accounts, perhaps, for the imperfect solidification of some specimens of plaster. It is sometimes impure, by reason of original or subsequent admixture of foreign substances.

Results of imperfect preparation.

A difficulty may also arise, if the plaster has not been ground sufficiently fine, in consequence of the setting taking place before the coarser particles have absorbed their quantum of moisture. In this case, the expansion, instead of taking place, as it should, while the plaster is soft, is continued after it has solidified.

This quality of setting depends, moreover, not only upon its original purity and correctness of manipulation in the manufacture, but largely upon subsequent care in keeping it, and the manner in which it is mixed for use. As it has the property of absorbing moisture from the atmosphere, it should be kept in a metallic, earthen, or glass vessel, perfectly covered, and in a dry, *warm* place. Frost injures its quality. Plaster which does not work well, by reason of the absorption of moisture from the atmosphere, may frequently be restored by submitting it to the ordinary temperature of the baking-oven of a cook-stove until it is thoroughly warmed through. It will not work satisfactorily if cold.

Keep plaster dry and warm.

Preparatory to mixing.

Presuming that it is a pure article, has been properly calcined and ground, and carefully kept, the next item of importance is, that it be properly mixed. It should be passed through a sieve of bolting-cloth previous to being used. Ordinarily, the temperature of the water for mixing should be about 70° F. Ice-water should never be used. Warm (not hot) soft water is the best, if it is desired to have it set quickly. The temperature of the water used will decide largely the time required for its solidification. There is less liability of air-bubbles if warm water is used. The quantity of water used will also determine the period required for the setting; the less water the quicker it will set; but plaster mixed stiff will always contain bubbles.

Tepid water best.

Best way to mix.

The best method of mixing is to take the required quantity of water (easily determined by experiment), sprinkling the plaster into it, by the use of a sieve, until of sufficient consistence; if the reverse plan is pursued—the water poured into the plaster—it will crystallize unequally, and be filled with

air-bubbles. A teacup or bowl is the best form of vessel to mix it in. Thorough stirring or beating makes it tough and pasty. The longer it is agitated and beaten, the less subsequent expansion there will be, for the reason that each granule becomes saturated before solidification takes place; whereas, if too little water is used, or the plaster is allowed to set before the center of the granules is saturated, they will continue to absorb from their surfaces, and expansion will continue with some plaster for a considerable time.

To hasten the setting.

To facilitate the setting, many different substances have been recommended, such as common salt, potash-alum, potassium sulfate, sodium silicate (liquid silex), etc. Of these, the alum and silicate are unpleasant in the mouth, and the latter is unreliable, making the plaster set too quickly, while the potassium sulfate does not appear to possess any superiority over common salt (except that a very small quantity suffices, and in making models it causes no efflorescence). A small pinch of salt is all that is required for an impression; an excess will cause too prompt setting, and will effloresce, and make the impression rough on the surface,—the tendency to which, however, will be obviated by promptly varnishing it after its withdrawal. A *large* excess of salt will retard the setting. The varying effects of different quantities are shown in the following results, obtained from a single sample of plaster, the quantity of water and plaster being in each case the same: The plain plaster set in five and a half minutes. The addition of two grains of salt caused it to set in five minutes, of four grains in three and a half minutes, of eight grains in three minutes, of sixteen grains in two minutes, of thirty-two grains in one minute, of sixty-four grains in two and a quarter minutes, of one hundred and twenty-eight grains in eight minutes, and a saturated solution required twenty-four minutes.

Influence of salt.

When to add the salt.

The practice of some is to add the salt to the water; others consider that the best time for adding it is when the plaster is ready for use, and just before it is put in the tray,—the salt thus beginning to act as the plaster is introduced into the mouth, allowing the use of a thinner batter, and yet insuring a speedy setting. The addition of the salt prevents the plaster from becoming as hard as it otherwise would; but for impressions this is not an objection.

Fluid ready for mixing plaster.

Some operators keep ready a pint bottle of water in which has been dissolved a heaping teaspoonful of potash-alum for use in mixing plaster for impressions.

Plaster should not set too rapidly, nor should it be too long in hardening; but if a choice has to be made between the two conditions, the latter is to be preferred, for the reason that the slow-setting plaster gives the operator ample time for preliminary management. He should never be hurried, as is likely to be the case in quick-setting plaster. This is of more importance than is generally considered. If it is desired to retard the setting, a solution of white glue, sugar, molasses, or vinegar may be added to the water with which the plaster is mixed.

Time of setting.

To retard the setting.

Flavoring. The suggestion has been made that three or four drops of oil of wintergreen, or cinnamon, added to the water with which the plaster is mixed, agreeably modifies the objectionable taste of the plaster.

Dr. L. C. Ingersoll advises adding to plaster of Paris from one-third to one-half of pulverized pumice, according to the strength of the plaster. By this means he claims that adhesion to the teeth is almost entirely prevented, and that there is less liability to fracture of the impression on its removal from the mouth.

Adding pumice.

Wax and plaster impressions. Some prefer to take an impression first in wax, giving it a lateral, anterior and posterior movement in the mouth, or subsequently enlarging it by cutting, so as to give space for the batter of plaster with which the final impression is taken. This method is considered specially applicable when the mouth is not uniformly hard,—in some places soft and yielding,—the object being to allow trimming off the impression corresponding to those places where the tissues are yielding, and have been pressed out of place, in order that a greater depth of plaster may be brought into contact with them, as, being softer than the wax, it will allow them to retain their relative normal positions. After the wax impression is taken for this purpose, the surplus wax should be trimmed off, and the surface scored, to make retaining-points for the plaster. To prevent the wax from leaving the tray, its surface should be warmed over a spirit-lamp.

Plaster and wax impressions. Others employ a method the reverse of the one just described. Plaster is first used in taking the impression, which, after becoming hard, is uniformly trimmed over the surface sufficiently to admit of a layer of wax or modelling composition. Either of these materials, when well softened, will yield an impression of the softer tissues of the ridge under pressure, as would normally result from the force of the opposing jaw upon the finished denture when placed in the mouth.

This method will often prevent rocking of the plate.

Impressions wholly of plaster of Paris.

For a full upper impression wholly of plaster, the mouth should be carefully examined, and the proper tray selected, one as near the size of the jaw as possible; if it is a high arch, the center of the tray should be filled up with wax, and with the same material any deficiency in the size of the tray at the palatal margin or around the outside edge, especially over the cuspids, should be supplied. Many failures are unquestionably attributable to a want of support in the summit of the arch, permitting the too great bulk of plaster to drop before solidification takes place; a difficulty obviated by having a smaller quantity of the batter sustained by a dome of wax. Some operators recommend a rim of wax to be carried entirely around the periphery of the cup, including the posterior margin; the object being to enable the operator to press in the plaster above the alveolar border, and to prevent in part its being forced too rapidly or in too large quantities over the posterior margin; but care should be taken that this rim be not deep enough to press unduly upon the soft palate, and distort the impression.

Obviating failures.

Posterior margin.

Deep alveolar ridges.

If the alveolar ridge is very deep, or the vault presents the form of a fissure, making considerable space between the tray and the floor of the palate, the tray should be driven up on a mold, corresponding in shape with the form of the mouth; otherwise the plaster will not be carried to the deepest portion of the arch, and thus there will be an imperfect impression of the palatal surface. Another plan is to take up a small portion of plaster on the finger or a spatula, and apply it to the deeper parts of the arch just prior to the introduction of the tray.

Arranging Patient to Take Impression.

The patient being seated,—a common chair is preferred by many operators,—instructions should be given as to position and the reasons therefor; the patient inclining the body slightly forward, and in readiness when the plaster is introduced to allow the head to be thrown still more forward,—the object being to determine any excess of plaster to the front of the mouth, and prevent it from falling into the fauces. Too many directions and an ostentatious preparation will, however, cause failure with timid patients, by inducing undue nervous irritability, from a magnified fear of the operation.

Cover the patient's lap. When about to take a plaster impression, a towel or large napkin should be spread on the front of the patient's dress to receive any excess of plaster which may be dislodged.

Preparing the mouth. The patient may be directed to dry the mouth with a soft napkin if there is an excess of saliva; but it is rarely if ever necessary in taking impressions of the upper jaw, and some mouths are naturally so dry that the difficulty is rather to prevent the plaster from adhering too firmly to the tissues. In such cases, it is not well to absorb what little moisture there may be. Some operators direct the mouth to be

Impression adhering to the mouth. rinsed with warm water, which, it is claimed, by removing the mucus, facilitates a more even flow of the plaster, diminishes its liability to an undue adherence to the membranes, and produces a smoother and more delicate impression. Others brush the parts over with glycerol, if the mucous membrane appears abnormally dry.

Instructions to patient about breathing. Before introducing the tray, some operators instruct the patient to breathe through the nostrils, considering that the liability of fragments of plaster being drawn into the pharynx is much increased when the patient breathes through the mouth.

A contrary view. The late Dr. Joseph Richardson took, however, an opposite view, arguing that in the act of breathing through the nose the velum palati is depressed to cut off the passage of air through the mouth, and is thus brought more immediately in contact with any portion of plaster that may be protruding from the heel of the tray; that the stimulus of contact produces involuntary contraction, and that thus fragments of hard plaster may be drawn back into the fauces, producing the very evils which nose-breathing is thought to avoid; and that if patients are instructed at all in this respect, they should be advised to breathe through the mouth.

To hasten the setting of plaster of Paris. The required quantity of water, say two tablespoonfuls, should then be put in a bowl or teacup, a pinch of salt added, and plaster sufficient to make a batter about the consistence of thick molasses should be *sprinkled*

To mix plaster of Paris. in. If put in carelessly, it will become lumpy, and may prove disastrous to the impression. The batter should now be well stirred and transferred to the tray.

The consistence to mix. The filling of the tray should be commenced before the plaster has set to the point suitable for insertion in the mouth. The rule generally given, to wait until the

plaster fails to fall from the spatula, is an error. It is then too stiff to put into the tray; allowance must be made for the time required to place it in the mouth. So long as the surface glosses, when smoothed with the spatula, and does not begin to leave sharp edges, it will take a perfect impression with *very moderate* pressure; but if too thin, difficulty will be experienced from its spreading and running from the tray. The perfection of the impression will mainly depend on the insertion of the plaster, when the smallest possible pressure will be required. Sufficient plaster should be used to insure the filling of all spaces, with a *small* quantity to spare. A knowledge of the amount necessary can only be acquired by experience; too much makes it difficult to insert, and will also cause a larger amount to be forced over into the mouth,—a result always disagreeable to the patient and unpleasant to the operator.

A common error.

How much plaster to use.

Introducing the Filled Tray.

When the tray is introduced into the mouth, it should be passed up to the palatal arch, touching the posterior portion of the palate first, to throw all excess of plaster toward the front of the mouth. It should then be brought gently up over the anterior surface until the parts are completely imbedded and the plaster is seen to protrude around the margins of the tray. When the tray has fairly covered the ridge, a slight vibratory motion should be given to it to settle the plaster and dislodge any bubbles of air; at the same time the head of the patient should be thrown well forward and the body still more inclined. The formation of air-bubbles in the roof of the mouth cannot be thus prevented; this liability must be guarded against by having the plaster high enough in the center of the tray. The tray, when once placed, should be retained in its *exact* position with great care until the plaster sets. The operator himself should always hold it, using no more pressure than is necessary to keep it in place and retaining it, not by the handle, but by one or two fingers of his right hand upon the center of the tray, with his left hand resting upon the patient's head. The tray should never be intrusted to the patient. At the same time the lip should be extended and brought down over the tray, subsequently making pressure on the lip and cheeks to force the plaster well up on the outside of the ridge. When the alveolar ridge is much absorbed, the foldings of the mucous

To avoid air-bubbles.

The operator to hold while plaster sets.

membrane should be prevented from becoming involved by pressing them out with the fingers.

Danger in improperly introducing the tray.

The liability of having an excess of plaster pass backward toward the pharynx is a real danger. A serious accident of this nature might readily occur. It not infrequently happens, when the tray is pressed anteriorly first, that a large excess will pass over and interfere with respiration. This excess is liable to fracture when hard, and, becoming loose, may pass into the pharynx and endanger the patient. To obviate this it has been suggested to place around the palatal surface of the tray pieces of string, extending slightly beyond the posterior margin, which, becoming imbedded in the soft plaster, will draw out any portion that may become loose. This precaution is, however, unnecessary, if care is taken not to use an excess of plaster, to bring the posterior portion of the tray first into contact with the palate, and to have the patient lean well forward.

How to avoid it.

When to remove from mouth.

To judge when the plaster is hard enough to remove from the mouth, the evolution of heat, as the result of the chemical action which has taken place, will be a guide. It has been recommended to test by the fracture of the plaster left on the edge of the bowl in which it has been mixed; but, while some say that the secretions of the mouth feed the plaster and prevent it from hardening as soon as that in the bowl, others contend that the heat of the mouth causes it to set somewhat quicker. The safest plan, therefore, is to test that on the edge of the impression, or to know by previous trial the "behavior" of the plaster used, and determine by the *watch*.

How to withdraw impression.

When ready to withdraw the tray from the mouth, the upper lip should be stretched upward, at the position of the second bicuspids, with the left hand, so as to admit air between the plaster and the gum; at the same time the tray should be pressed downward with the right hand. If the plaster is left in the mouth too long after it hardens, it is likely to adhere very strongly to the mucous membrane, owing to the absorbing property of the plaster. In such cases no undue force should be used in the withdrawal, as there is liability to tear the membrane; the only plan is to *coax* it out. The tissues of the lip and cheeks should be lifted alternately, and, if necessary, the patient directed to give a slight cough; or, upward pressure upon the handle of the tray may be made, which will depress it at the heel; or, with a suitable instru-

Danger in leaving too long in the mouth.

ment, the soft palate may be pressed up to admit the air; or, preferably, through a hole in the center of the cup, a blunt instrument may be passed up to the palate, and thus admit air between it and the impression. By this means there is less danger of injuring the impression than by introducing air at the sides, which can only be done by more or less depression of the tray. These means will generally, with a little patience on the part of the operator, effect removal without damage to the mouth or to the impression. A pair of foil-pliers should always be at hand, to take out of the mouth any pieces of plaster which may break off during the withdrawal of the tray. These pieces should be rinsed clean of saliva, and replaced on the impression, after hardening, with great care and nicety.

Air to facilitate the removal of the plaster impression.

Pieces of plaster which break off.

It has been recommended, to facilitate the removal of an impression, that a small hole be made in the center of the tray, through which a fine cord or thick thread is passed so that a quarter of an inch of its end shall project from the surface of the impression-material. Before removing the impression the cord is drawn out, thus admitting air to the vault to facilitate the detachment of the impression.

Another way of admitting air.

In taking impressions of the lower jaw, for a full denture, the tray should be adapted to the case in hand as to depth and shape of rim, which should extend downward on its lingual extremities so as to secure an accurate impression of the lingual aspect of the ridge. It is necessary to allow the plaster to set until it will not drop from the inverted impression-tray. It should then be placed in the mouth, and carefully depressed at the posterior portion first. When the patient has an excess of saliva, care should be taken to have the mouth dried with a soft napkin. After filling the tray flush with its margins, the operator should introduce it into the mouth in the manner heretofore described, standing either to the right and over or in front of the patient. If the latter position is chosen, after having adjusted the tray—which of course is bottom upward—properly over the ridge, the first two or three fingers of each hand should be placed upon the top of each side of the tray, over the position of the bicuspids, and the thumbs underneath the jaw, steady and firm pressure being made until the ridge is wholly imbedded, the patient sitting in the position recommended in taking upper impressions.

Plaster impressions of the lower jaw.

Plaster to partially set before introduction.

Proper methods of applying pressure.

If the operator stands behind the patient, pressure should be made upon the tray with the thumbs, and counter-pressure with the fingers under the jaw, care being taken to draw out the cheeks before making pressure upon the tray, as the soft tissues are apt to overlap the posterior margin of the alveolar border. The patient should then be requested to thrust the tongue out of the mouth as far as possible, so as to free the soft tissues from entanglement. When the plaster has set, the tray may be freed by pressing the finger of the left hand against the inner surface of the cheek, outward and downward, so as to admit air under the impression.

Freeing the soft tissues.

Special Cases.

Where great absorption of the maxillary ridge has taken place.

In middle life, or in old age, when there has been great absorption, the muscles of the mouth are on a line with, or sometimes higher than, the maxillary ridge; the outer edge of the tray should then be turned out at a right angle with the body. If the edges of the tray are too straight, or the two sides are in nearly parallel lines with each other, the outer edge presses the muscles down over the maxillary bone, and when the reverse is taken from it there will be a sharp-ridged cast; and when the plate is made to fit the cast, the edge will cut the muscles, and make a sore mouth. But by using a tray with the outer edge flared (see lower tray, Nos. 5 and 6, pages 70 and 71) so as to drive the cheek outward, the muscles are drawn on a line where they are connected with the ridge of the jaw, and more nearly in their natural position. When a plate is made from an impression so taken, the muscles will have free play under the edge of the plate, and will not lift it from the jaw and float it around the mouth.

To avoid a sharp-ridged cast.

In taking impressions for partial cases, to prevent difficulty in the withdrawal of the impression, the shape and position of the teeth should be carefully noted, and manipulations made accordingly. Before taking the impression, undercuts, etc., should be looked for, which must serve as a guide in the withdrawal of it. Where the teeth are wedge-shaped, or conical, or straight and short, there will be no difficulty; but where they are long, or inclined, or where the necks are smaller than the crowns, they will not deliver without fracturing the plas-

Undercut impressions.

ter. In some cases a little wax, pressed into the interdental spaces, may serve a good purpose by preventing the plaster from entering. The impression should be removed from the mouth before the plaster has set so as to make it liable to fracture, or else allowed to remain until it is sufficiently hard to make a clean fracture. There is danger, however, if there are loose teeth in the mouth, of extracting them in the removal of the impression.

In case of loose teeth.

In such cases it has been recommended to dry the teeth, and put a cylinder of wax around them; and, if great care and nicety is observed, this plan will give good results. It has also been suggested to take fibers of raw cotton and place in the tray where the teeth will strike, and run some thin plaster over it in the form of batter. This will prevent the plaster from breaking up into such fine particles as it otherwise might.

Impressions of difficult cases.

Various plans have been recommended for taking impressions of difficult cases. The following embrace all that are thought to be of special importance:

Temporary trays.

Having taken an impression in wax, a metallic die and counter-die are made, as for ordinary plate-work. From this a plate of brass, tin, or zinc is struck up, to be used as an impression-tray, the palatal surface of which is coated with a thin batter of plaster, and applied to the mouth in the usual manner. Others prefer taking a wax impression, from which all those portions indented by the teeth are subsequently cut away, allowing only so much of the wax surface to remain as corresponds with the artificial base to be supplied. This is subsequently employed as a tray with which to take a plaster impression.

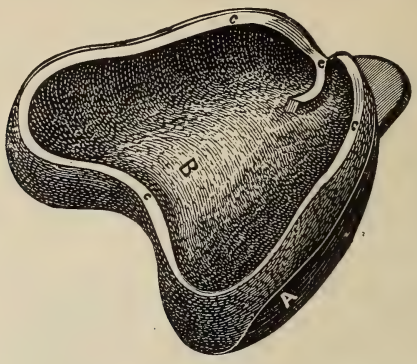
Converging teeth.

In case of converging teeth, the spaces between them may be first packed with thick mixed plaster (or with modelling composition or wax), and the sides sloped smoothly, so that when varnished and oiled, the subsequent impression will on removal leave the sections in the mouth. They can then be laterally displaced and returned to the impression.

Dr. A. Westcott's plan for full denture.

A process for taking plaster impressions for entire superior dentures was suggested by Dr. A. Westcott. Take a wax impression as a preliminary step. When cold, carve with knives curved laterally, and with bent gouges, with great care. After deciding as to the proper form and size of the impression, and in a general way trimming off all the wax which is not needed, make a cut in the wax one-eighth of an inch deep on the inside of the impression, and about one-eighth of an inch from

the margin. This cut should follow the entire margin of the wax impression, and across the palatal surface. Now carve out the entire surface of the wax to the depth of from one-eighth to one quarter of an inch, except a narrow strip, perhaps one-quarter of an inch wide at the extreme front, and at the place of greatest depression in the wax. When this impression is replaced in the mouth,



it rests firmly upon the unchanged strip running across the rear end of the palatal arch, and at the same time bears upon the uncarved strip at the front of the impression.

An impression having these resting points can be held steady by pressure bearing upward against the center of the impression-tray long enough for the plaster to set.

Partial Cases.

Governing fractures in partial cases.

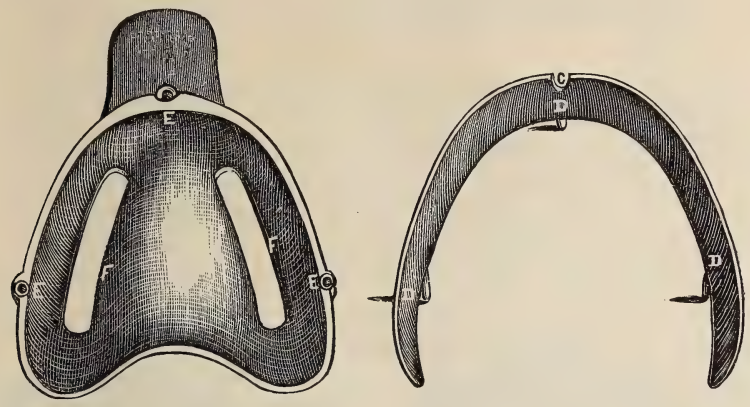
There is a liability, in partial cases, that the plaster will break in a number of pieces. To determine in advance the lines of fracture, Dr. A. G. Bennett suggests that the impression-tray be warm and a narrow strip of base wax attached to its floor, dividing the space between the outer rim and the palatal projection; a like strip running from this to the rear of the tray. The tray is then to be oiled, filled with plaster, and the impression taken. The tray comes away leaving the plaster adhering to the teeth, the wax remaining in the impression, and serving as a guide to show where it may be cut. The impression may then be removed, the pieces replaced in the tray and attached with fresh plaster.

Dr. A. G. Bennett's suggestion.

Dr. A. Westcott's plan for partial cases.

Dr. A. Westcott described a plan for taking impressions for partial cases with plaster: Saw off the rim of an ordinary tray with a fine saw, and again

couple it with the palatal portion by brass dowels. Take the rim and solder on to it three short pieces of brass wire,—one on the front and one on each side of the rim. Next, solder on three short pieces of brass tubing, corresponding in position and in size of hole with the wire dowels already soldered on to the rim. By this arrangement the rim may be removed and replaced at pleasure.



Making the wax stick to the tray.

As it is very desirable to bring away the wax and plaster with the palatal portion of the tray, provision must be made against the cleavage of the wax from the tray. This may be done by holding the tray over a spirit-lamp, and securing an adhesion by melting the wax; but a much easier way is to perforate the base of the tray. In taking the wax impression preliminary to the plaster impression, the wax will press through these orifices more or less, and by spreading out like the head of a rivet on the bottom of the tray, make a strong and secure hold when the wax is cold. These orifices will be found a convenience in any case of plaster impression-taking.

When the two parts of the tray are placed together so as to form a tray of the usual form, and the wax impression taken, as above described, pass a thin blade through the seam or joining, and separate the wax so that both rim and wax may be easily taken from the lower or palatal portion of the tray. Separating the two parts on this line leaves all, both plaster and wax, within the rim in the mouth, while the palatal portion is removed. To remove the portion embraced within the rim easily, and without unnecessary crumbling, spring off first one end of the rim and then the other, and remove the rim from the mouth. Then, by a thin, though not sharp, knife, or firm spatula, divide the plaster, which is still in the

mouth and outside the teeth, into three sections, which may generally be removed without breaking elsewhere, and in such way that the pieces may be readily returned to their proper places.

Cut-offs. There may be *cut-offs* of wax placed where it is desired that the plaster should separate, so that the sections may be very easily removed. These cut-offs consist simply of thin plates of wax set up edgewise, so as to divide the plaster while thin into any number of sections, and reach from the rim of the tray to the teeth or gum.

Teeth with vacant spaces between. In taking an impression where there are teeth with spaces of naked gum between them, and especially where the teeth are bell-crowned, it is well to set up thin slips of wax from tooth to tooth, or else leave such cut-offs, when carving the wax, to make room for the plaster. In making impressions for partial sets, there is not the same necessity for providing against the rocking of the impression-tray, as the depressions made by the teeth in the wax are not obliterated by the carving, and these will serve as the steadying-points when the wax is returned with the plaster for the final impression. By carrying out these suggestions, there is no more difficulty in getting a perfect impression of *every part* in mixed cases than pertains to full sets where the gums are entirely naked.

Dr. S. E. Gilbert's method of taking an upper partial impression. Dr. S. E. Gilbert suggested the following method of taking a partial upper impression: Place enough plaster against the palatal surface of the tray to fill the mouth even with the masticating surfaces of the teeth, adding a little plaster around the inside of the rim; a rim of wax having previously been built across the palatal edge of the tray.

Dr. W. N. Chaffee's plan for partial impression in plaster. Dr. W. N. Chaffee suggested this plan of taking a perfect impression in plaster for a partial set, when the remaining teeth are long, and have large crowns, small necks, and incline toward one another:

Select an impression-tray of suitable dimensions, preferably with a square-turned rim, instead of an oval one, as it accommodates the teeth much better. Prepare the tray by bridging across the back edge with a thin strip of wax not thicker than a knife-blade, to prevent the plaster from dropping over into the throat.

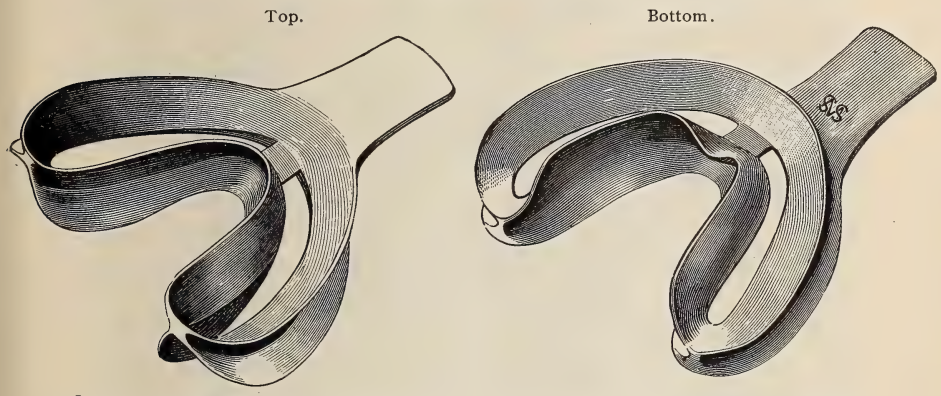
Then soften some wax in warm water, making it as soft as possible without melting, and roll it out into a stick as large as the little finger, and long enough to pass around on the inside of the border of the tray, from heel to heel. Heat the tray over a spirit-lamp

sufficiently to attach the wax to it, and lay the wax in around the border. The principal point to be observed in this method is expedition. After placing the wax in the tray, the plaster, mixed with warm water, in order not to chill the wax, should be placed in the tray, and introduced into the mouth as quickly as possible, while the wax is in a plastic condition.

The wax takes the impression of the teeth very kindly, while the plaster gives a perfect impression of the whole palatal surface, and facilitates the removal of the model.

Dr. B. W. Franklin's trays for plaster impression of the inferior jaw.

Dr. B. W. Franklin devised a tray for taking impressions of the inferior ridge. This tray, or rather double tray, has an opening all the way round, except a narrow bridge at the front. The advantages of the opening are that when the under part of the tray is filled, and the upper part one-fourth full of plaster, and placed in position over the ridge, the operator with the end of the



finger can force the plaster into the under tray and secure a perfect impression.

Dr. A. G. Bennett's suggestion in difficult partial cases.

For difficult partial cases Dr. A. G. Bennett suggested the selection of artificial teeth, which are to be ground to fit in the spaces, and secured in place with hard wax. The impression is then to be taken, and, after removal, the teeth are placed in position. This method requires no articulation out of the mouth.

Dr. Charles J. Essig's method of obtaining impressions of difficult partial cases.

Dr. Charles J. Essig suggested for obtaining impressions of difficult partial cases the following plan, but it is not applicable where interdental spaces are frequent or large:

An impression-tray should first be selected of the proper size and shape,—those with the flat floor are

best for partial cases (see pages 57 to 59); the plaster should be mixed thin, almost as thin as water, adding salt to facilitate setting. Oil the tray, so that it will readily separate from the impression when hard; fill the tray as soon as the plaster thickens sufficiently; then, with a small spatula, place a layer of the soft plaster upon the palatal surface of the mouth; otherwise by inclosing the air in the deep portion of the arch the accuracy of the impression may be impaired. After this precaution the tray is placed in the mouth, and gently pressed up until its *floor comes in contact with the teeth.* When the plaster is sufficiently hardened, remove the tray—which, from its having been oiled, is done without difficulty. With the thumb and index finger break off the outside walls. The portion covering the palatal surface is then removed by the use of a blunt steel spatula, curved at the end in the form of a hook. The pieces are then placed back into the tray, where they will be found to articulate with perfect accuracy.

Dr. S. E. Gilbert's plan in lower cases.

For taking a partial lower impression, when the teeth are elongated or loose, or lean in different directions, Dr. S. E. Gilbert advises to first obtain an impression in wax and make a plaster model; then fit wax caps over the crowns of the plaster teeth, extending almost to the gums. These wax caps are to be removed from the model, and placed upon the natural teeth, and an impression taken in plaster as usual.

Dr. J. B. Bean's recommendation.

The late Dr. James B. Bean, of Baltimore, recommended that a wax impression should be taken, from which dies must be prepared; a metallic plate swaged, on which from ridge to ridge a strip of metal should be soldered. Between this and the plate he passed a stick, to serve as a handle in removing the impression. Then, after heating the plate, he coated the palatal surface with shellac, and upon this placed a thin layer of raw cotton, which, adhering to the resin, and permeating the plaster batter, when poured on, prevented the thin impression from breaking up into fragments.

Cotton to prevent fractures in partial impressions.

Prof. P. H. Austen's gutta-percha tray and its uses.

Professor P. H. Austen designed a gutta-percha tray which is thus described: Take a wax impression and make a model; in partial cases, brush over the teeth of the model one or two layers of thin plaster, to fill up all undercuts, and to make the plate fit loosely; saturate the model with water, and mold over it a gutta-percha tray. This last is done, not by using the gutta-percha in sheet, but by first making it into a ball, then working it from the palate outward, leaving a thick mass in the center. It should be, on the inside, from one-fourth to one-

half of an inch thick, so as to be stiff and unyielding; but on the outside not more than one-eighth or one-sixteenth inch thick, so as to be slightly elastic and yielding. The whole inside of the tray must be roughened up with a scaler or excavator, in such a way that the plaster can take firm hold. In most partial cases, the impression will have to be removed in sections; the inside remaining entire, but the outside and the parts between the teeth coming away separately. In certain cases, it is necessary to partially cut through the tray before putting in the plaster, and usually upon the thick masses of gum which fill the interdental spaces. A cut on the inside, in line with the ridge, gives pliancy to an otherwise rigid tray, and permits its easy removal. When it is desirable to extend the tray around the entire arch, so as to get an exact plaster impression, not only of the gum but of all the remaining teeth, this rim of gutta-percha must be slit at two or three points, to give that pliancy which is a chief merit in this form of tray. These trays have no handle, but are removed by inserting a plugging instrument into a small hole previously made in the back part of the tray where it is thickest.

Dr. Horace Dean describes a method of taking an impression of a partial upper case substantially as follows:

Dr. Horace Dean's method.

For partial upper cases.

Take a correct wax impression. In this cast a plaster model. Separate as soon as set. On the model place sheet wax to cover all the portions of which a copy is desired, including the palatal surface, but not the grinding-surfaces, of the teeth. In the spaces between the teeth let the wax be quite thick. Over this wax plate carefully adapt a piece of wire mosquito-netting so that it touches the wax and the grinding-surfaces of the teeth. Coat with glycerol the parts of the model not covered with the wax. Pour a coat of plaster over the wax and net, covering the grinding-surfaces of the teeth and a narrow space behind the wax plate. When hard, separate and remove the wax. Try the shell in the mouth, and trim so that it goes easily into place and rests firmly on the ends of the teeth. Soak this shell in water, and fill with plaster mixed as usual. Place in the mouth, and press until it rests on the teeth.

For full upper cases.

For a full upper case take the impression in wax, and make a model. Mark on the model places where the shell can rest firmly. Construct the shell as before described, and take the plaster impression.

For partial lower cases.

For a partial lower case proceed as before, except leaving a portion of the wire net, just back of the

front teeth, uncovered by plaster. This forms a hinge which permits the free ends of the shell to be pressed toward the tongue, thus carrying the plaster past the teeth until the shell is in place. The wings may then be pressed against the teeth and so held until the plaster has set, when, if necessary, the wings may again be pressed inward, breaking the impression at the hinge with a clean fracture, which serves as a guide to correct restoration.

Dr. S. H. Guilford's method.

A method recommended by Dr. S. H. Guilford is to place pieces of wax on the tray at points corresponding to the natural teeth remaining in the mouth; then, keeping the wax warm and plastic, fill the remainder of the tray with plaster.

Dr. J. F. Leaming's method for plaster impressions without tray.

Dr. J. F. Leaming proposed a method of taking upper impressions with plaster without a tray:

After carefully examining the mouth, mix a sufficient quantity of plaster to the consistence requisite to pour into a mold, adding a little salt, if necessary, and stirring constantly, until it gives evidence of setting. Care should be taken not to delay too long, as better results are obtained while the plaster is quite thin. Distending the mouth slightly with the left hand, introduce the plaster quickly, but not hurriedly, upon the point of the spatula, first covering the arch until overfull, then upon the buccal aspect of the gum, beginning posteriorly on both sides, and finishing anteriorly, pressing the plaster carefully to the gum, in front, with a napkin. Remove, by first pressing the impression at the sides carefully downward. If any portion of the rim is imperfect, trim down as far as needful, wet the impression, reapply it to the mouth, and build up with fresh plaster.

When the gum in front is soft and flabby.

For a full case, where the gum in front is soft and flabby, it has been recommended to use soft wax for a first impression, making the wax adhere to the tray; when cold, cutting a deep grove, into which the softer portion of the gum can depend, leaving the waxed ridge quite high all around, and if the roof is hard, having the wax sufficiently high at that point to press it gently. The plaster should be as stiff as can be used without pressing the soft tissues out of place.

Dr. F. C. Green's narrow tray for lower impressions.

Dr. F. C. Green, for a full lower impression, recommends a very narrow tray,—one not much wider than the alveolar ridge; the tray to be filled with quick-setting soft plaster. After removing the tray from the mouth, the edges are to be trimmed, and a thin layer scraped from the entire surface, especially under the tongue. The

impression is then to be thoroughly soaked in water, filled with plaster not thicker than cream, and replaced in the mouth with gentle pressure, care being taken that the tongue is raised and that the muscles are not impinged upon.

Dr. C. S. Chittenden's method of making a tray for special cases.

Dr. C. S. Chittenden recommended the following plan for making a tray for special cases: First take an impression in wax and draw a cast from it; then take a piece of sheet lead and fit it to the cast as nearly as possible, by rubbing down with burnishers, something like a trial plate, leaving it a little higher on the edges than a plate which is to be worn would bear to be. Use this lead pattern or trial plate for an impression-tray; but as it would not be stiff enough to answer that purpose of itself, punch some small holes through the lead, and pour plaster of Paris over the whole lingual surface, letting it run through the small holes in the lead, so as to bind the plaster firmly to it in the same way that mortar is bound to the lath on walls and ceilings. When the plaster has set, cut away all that will be in the way, and having prepared the plaster for the impression, pour it into this made-up tray, and, putting it into the mouth, press it home in the usual way.

Dr. Stewart J. Spence's method where inwardly inclining teeth remain.

For partial cases where the remaining teeth incline inward, Dr. Stewart J. Spence cuts from the selected tray its buccal flanges as far forward as the cuspid portions, and slits the vault part nearly to the labial flange, so that the two wings can be readily conformed to the width of the arch and to the depth of the vault. Pulverized potash-alum is added to the plaster, which is mixed moderately thick and piled on the vault part of the tray, extending to its front flange. The fingers can be used to press the plaster with the tray into the vault, while the protruding plaster is all scraped from the buccal cusps and surfaces of the bicuspids and molars. When the plaster has been given time to become very hard, it is cut from the grinding-surfaces of the bicuspids and molars so that these may, by the index finger wrapped with thick rubber dam, be successfully forced outward and so loosened from the plaster that it may be readily removed with the tray.

Dr. George F. Reese's reservoir idea.

Dr. George F. Reese suggests the following method for special cases:

Cut a hole through the floor of the tray, and over this place sheet wax, and with the same material make a shallow cup or reservoir on it; on the flange and across the palatal edge of the tray form a rim of wax. After the introduction of the tray, the

plaster in the reservoir can be manipulated with the finger, forcing it up into the arch.

For partial sets, melt wax over the tray. Add softened wax to take an accurate impression. Cool this in water and cut away the wax wherever the plaster is specially desired to go; rim the cavities with sheet wax to form reservoirs. After trial in the mouth fill in with plaster, taking care to have the reservoirs full, but no plaster in the impressions made in the wax by the teeth.

Preliminary impression in modelling composition.

It is sometimes advisable to take a preliminary impression in modelling composition, cut a groove across the palatal part of the impression, and from the groove raise a wall of soft modelling clay. Then gloss the surface of the compound over the spirit-lamp flame, spread an even coating of soft mixed plaster, and take the impression as usual. The soft clay will not disturb the palate, yet will perfectly prevent the passage past it of the plaster.

Dr. W. S. Payson's extension to impression-tray.

Dr. W. S. Payson suggests the following method of making an extension to an impression-tray:

Take a strip of thin sheet lead or tin and shape it to fit the rear floor and come around on the sides of the tray, flaring backward and standing as high as desired. Drill holes through the strip and tray, and sew them together. The plaster will thus be prevented from overflow into the fauces. By simply cutting the threads the tray may be restored to its original form, and be ready for another like modification to meet any peculiar case.

Dr. B. F. Rosson's plan.

Dr. B. F. Rosson suggested the following plan of taking impressions:

Impressions only of the parts where the plate rests.

The principle consists in obtaining an impression only of the parts upon which the plate is to rest; this is done by using for the lower jaw a very narrow impression-tray, and almost flat instead of deeply concave, as they usually are. This may be bent so as to partake as nearly as possible the form of the ridge of the jaw. A sheet of softened wax is then put upon the tray, and pressed upon the jaw till a good impression is secured; then trim down the wax just to the size the plate is to be; now use this for the plaster impression-tray; a very small portion of plaster properly prepared will be sufficient to obtain a very perfect impression. The plaster should at no point be permitted to pass much beyond the proposed border of the plate; this is to prevent pressing and distending the soft tissues on both sides of the ridges; such distention usually draws the mucous membrane of the gum out of position. Immediately after the tray

with the plaster is placed on the jaw, the tongue should be raised above the tray and kept there till the plaster has set.

The tray for the upper jaw should not extend much beyond the ridge all around, so that the same principle is observed as described for the lower.

Dr. L. E. Custer's difficult upper partial cases.

Dr. L. E. Custer adopts the following method in taking an impression of a difficult upper partial case:

With a spatula bent the required shape, carry plaster of Paris of proper consistence to the roof of the mouth, and spread it as far back as necessary, adding more plaster until even with the necks of the teeth, leaving the exposed surface rough. Then with modelling composition take an impression over the hardened plaster, to which the composition will adhere, thus securing the advantages of both materials,—the plaster for the mucous membrane and the composition for the teeth.

The following method of obtaining an impression for an exceedingly difficult partial lower case has been described:

Broad jaw with contracted mouth and bulbous, inclining teeth.

The mouth offered serious obstacles to the procurement of a correct impression,—a broad jaw associated with a contracted oral opening; a cuspid and a molar, upon either side, which, inclining toward each other, inclosed interdental spaces of dovetailed form; the teeth of that bulbous configuration consequent upon an extensive absorption of the supporting structures. All of the customary plans for obtaining a cast were employed without success, but a satisfactory model was finally secured by the following process:

An impression in wax was first taken, from which the plaster cast was made, and the teeth removed as usual; but before imbedding in the sand the entire surface was evenly covered with sheet wax one-eighth or one-fourth of an inch in thickness. When the metallic models were made, a plate of ordinary tin or tinned iron was struck for an impression-tray; perforated to permit the teeth to pass through, and a handle soldered to stiffen the appliance and facilitate its introduction into and withdrawal from the mouth. The tray so constructed was adjusted to freely slide over the remaining teeth, its interior *thoroughly oiled,* and small pieces of wax placed over the apertures to prevent the batter from escaping while inverted. Thus filled, it was placed in position (the teeth readily displacing the loosely applied wax over the openings), and allowed to remain until the plaster had sufficiently solidified, when it was removed, leaving the hardened plaster to be carefully extracted in sections and replaced in proper position in the tray.

The success of this method will be largely, if not wholly, dependent upon the use of a *stiff* and *unyielding* cup, which shall not bend or spring from the application of the requisite force.

Full impressions for metal dies. For a full impression in which a metal die is to be cast, mix one-third of either fine sand, marble-dust, whiting, or pulverized quartz, with two-thirds plaster. Slowly and thoroughly dry the impression, and pour the metal into it at its lowest melting point. This plaster compound is also useful in difficult cases where an impression should be allowed to get quite hard prior to removal in easily broken sections.

Make model cast before the impression becomes too dry. The model should be taken before the plaster impression becomes dry, having previously coated it with something to prevent the adhesion of the plaster,—a solution of soap, a thin wash of collodion, or sandarac or shellac varnish. The solution of soap is made by adding an ounce of white Castile soap in powder or shavings to a pint of water, and heating it until the soap is dissolved. It should then be bottled, and poured out as needed for use, avoiding using it from the bottle, as it is rendered turbid by contact with a brush that has been used on plaster. Soap is best on a very moist impression; collodion or varnish on one partly dried. If the impression has become very dry, it is necessary to saturate it with water before

Coatings for plaster casts. pouring the plaster for the model. If varnish is used, oiling the surface after it becomes dry will insure the separation. The latter plan of varnishing the impression with an alcoholic solution of sandarac or shellac is strongly advocated, as the coloring matter by penetrating a short distance affords a guide in separating the model, and thus diminishes the liability to fracture or mutilate the cast,—an accident often occurring when there is no line of demarkation, and one is obliged to rely upon his mental outline of the case. The water with which the plaster is mixed

Coloring impressions. for taking an impression is sometimes colored for the same purpose by the use of a few drops of a solution of carmine or anilin, or by the addition to the dry plaster of a small quantity of Venetian red, Spanish brown, burnt umber, cochineal, indigo, washing-blue, or vermilion. Enough of either to answer the purpose is not detrimental to the plaster, and gives it an appearance pleasant to the eye of the patient.

On pages from 50 to 85 will be found illustrations of our full line of Impression Trays.

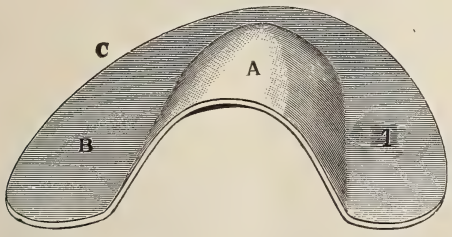
TAKING THE BITE.

By W. STORER HOW, D.D.S.,

Philadelphia, Pa.

Taking the bite may properly and best immediately follow taking the impression, without loss of time by either the patient or the dentist. The True Bite-Plates provide ready means for conducting these two operations at the first sitting, and such is the precision and certainty of the new method that the completed denture may be inserted at the second sitting with satisfaction to both patient and prosthetist. Of course, a carefully accurate impression is the essential prerequisite for success. Then, for a full upper denture, select a bite-plate (No. 1, 2, 3, 4, or 5), try it in the mouth, and if the edge contour (see Fig. 1, C) is not quite right when the lower teeth are closed upon it, trim the edge with shears, knife, or file.

FIG. 1.



Dry the plate, place a mass of very soft, warm wax over the dome A and sides B, press firmly into the vault and over the gum-ridge, as if taking an impression. Direct the patient to close the teeth upon the plate and keep the teeth closed while with the fingers the wax on the buccal sides and labial front is quickly pressed, and the patient is told to hold fast, or bite a little harder until the plate-edge is on a line somewhat above the lip-line, indicating a nearly proper length of bite.

Remove the plate, trim with wax-knife for contour, repeatedly try, trim and model until the plate out of the mouth looks like Fig. 2, and in the mouth like Fig. 3.

If the edge of the plate on the lip-line shows the bite too long, or too full in contour, hold the plate a moment over the Bunsen flame to soften the front, side, or whole plate surface of the wax (without softening the gum surface), try in, adjust, and have the patient increase the teeth pressure until the lip-line and contour are just right as indicated in Fig. 4.

Fig. 2.

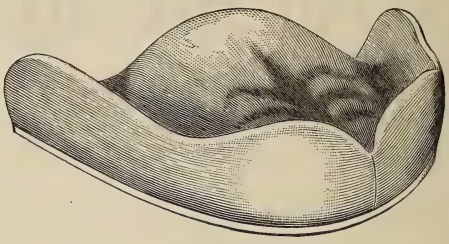


Fig. 3.

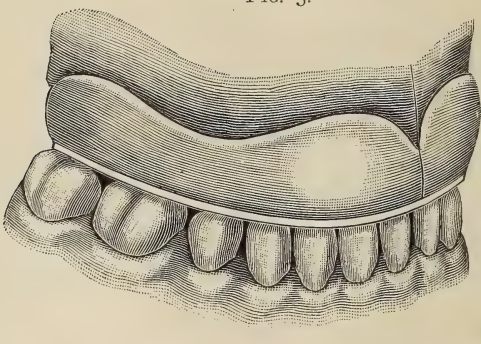
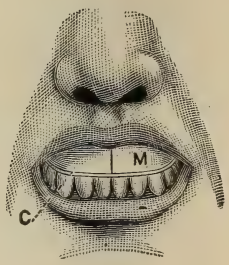


Fig. 4.



To increase the bite-length, heat the plate over the flame until it drops from the wax onto a piece of paper. Put on the plate one or two thin sheets of wax, replace on the modeled wax, try in the mouth, and proceed as before directed.

The smooth and hard surface of the bite-plate (B, Fig. 5) fixes a firm and constant limit to the bite-length, while allowing the utmost freedom

Fig. 5.

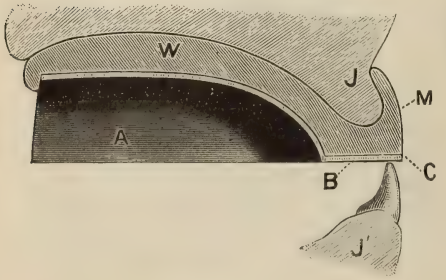
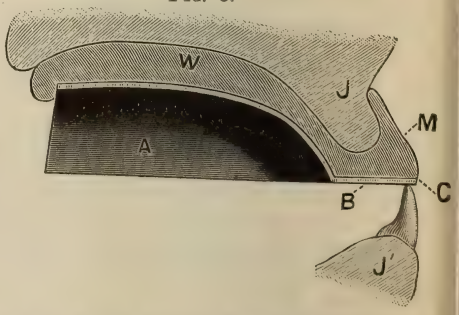


Fig. 6.



of lower jaw movement in occlusion during the adjusting and modeling work, in securing a natural oral and facial expression, with a proper lip-line, as shown in Fig. 4.

The median line, sectional view (Fig. 5), shows the relations of the bite-plate dome A, flat part B, contour edge C, wax W, modeling M, and jaws J, J. Fig. 6 shows how, by simply heating the plate and while in the mouth pressing and pulling it forward, the protrusion and modeling may be changed as desired.

By cutting away the labial wax (W, Fig. 7), to expose the anterior gum G and ridge-crest from cuspid-place to cuspid-place, the space between the bite-plane and the ridge-crest may be readily seen to determine exactly what sort of cross-pin or straight-pin teeth are permissible. The labial wax is then to be restored for contour and two thin softened sheets of wax placed on the dry bite-plate for the patient to bite quite through to the plate, with the result shown in Fig. 8. A like long bite appears in the sectional view, Fig. 9.

Fig. 7.

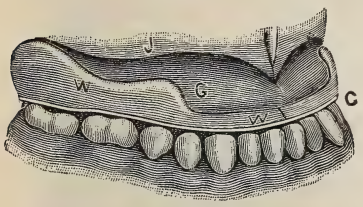


Fig. 8.

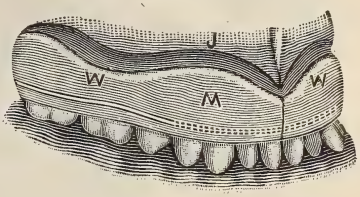
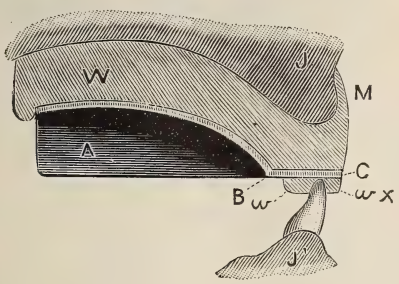


Fig. 9.



The patient should be instructed and practiced in the correct manner of closing the jaw; the head being thrown back to bring the face nearly horizontal and then held as far back as possible in the act of closing the teeth through the wax onto the bite-plane, as in Fig. 8. It is best to make several such closures into the freshly softened wax, to be sure that the final bite is as *far back as possible and every way exactly right.* Modelling composition may be used instead of wax.

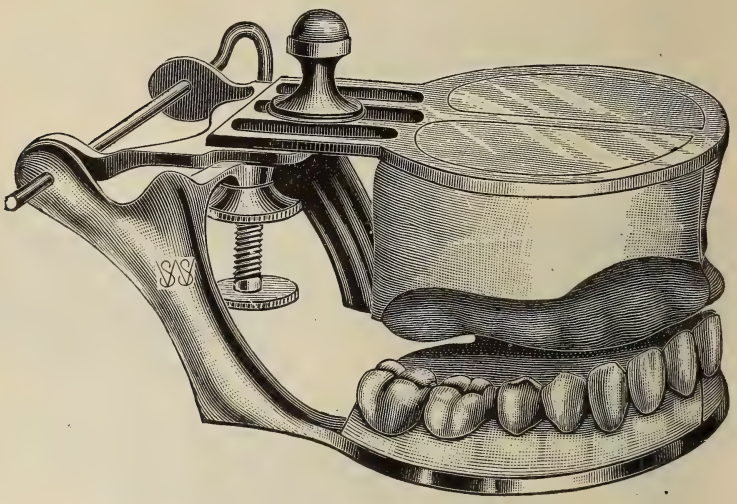
Thick mixed plaster or moldine may be piled on the bite-plane (B, Fig. 5), and the occluding surfaces of the lower teeth be perfectly copied for reproduction in fusible metal if desired.

The bite-plate is then carefully removed, put in cold water, and kept in safe readiness for transfer to the plaster model obtained from the prior impression. The bite-plate wax impression should closely fit upon the plaster model, and both be transferred to an articulator, resulting in a reliably correct bite, like that seen in Fig. 10.

When a full upper and lower denture is to be made, a lower bite-plate (No. 6, 7, 8, or 9), Fig. 11, is to be selected, with a suitable upper bite-plate, which, as previously described, is to be prepared in shape like Fig. 2, the lip-line and plane of occlusion being determined by hand pressure in the absence of the lower teeth.

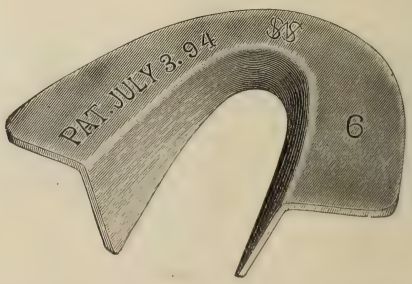
Then a similar process will produce a like lower bite, and repeated softenings and trials in the mouth, together with the like prepared upper bite-

Fig. 10.



plate, and marking the median line, after repeated occlusions will produce a correct bite. Then have the patient keep the jaws tightly closed while, with several warmed wire staples, or the wire bite-blocks devised by Dr. J. A. Robinson, the double bites are locked together for safe removal, as seen in Fig. 11 A. When placed upon the respective plaster models from the impressions and transferred to an articulator, the two plates constituting a correct bite will appear as shown in Fig. 13.

Fig. 11.



The correctness of the bite may be verified by replacing the united bite-plates in the mouth, distending the lips and cheeks with the forefinger to free them from entanglement with the plates, and making careful renewed observations to be sure that the bite is correct. The median line section, Fig. 12, shows such a bite.

Fig. 11 A.

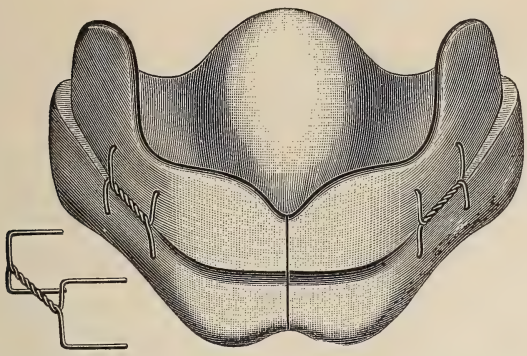


Fig. 12.

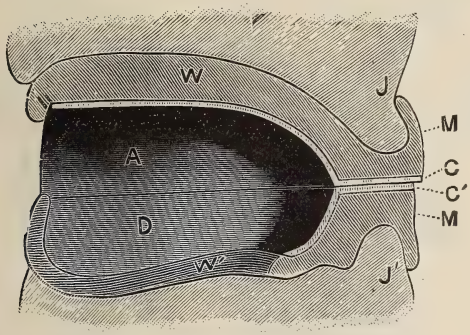
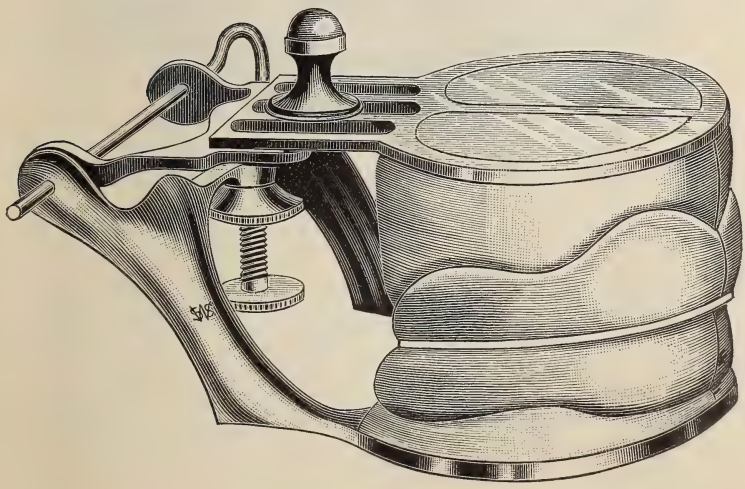


Fig. 13.



In some cases the duplex bite-plates (No. 10 or 11), Figs. 14 and 15, are available for full denture bites, following the previously described method of taking first the upper plate bite, cooling it, and then placing a thick roll of suitably softened wax on the bite-plane, directing the patient to slowly close the lower jaw into it, as if biting with the teeth, until by trials and trimmings of the wax a bite resembling that shown in Figs. 12 and 13 is obtained.

No. 11 bite-plate (Fig. 15) has an open dome to allow the pressing up of the wax by the forefinger to get a good impression of a high vault. For some full upper dentures of this kind the lower flanges of Nos. 10 or 11 may be cut off. The Nos. 10 or 11 (Figs. 14 and 15) are also useful for taking simultaneous impressions of the teeth in both jaws for regulating purposes, especially when it is desired to make a vulcanite or cast-metal plate, a portion of which is to cap the molars or other teeth. In such a case the bite-plane is to be cut away to allow the passage of the anterior teeth, leaving portions of the bite-plate to rest upon the teeth which are to be capped.

For partial upper dentures, sections of the bite-plate are with plate-

Fig. 14.

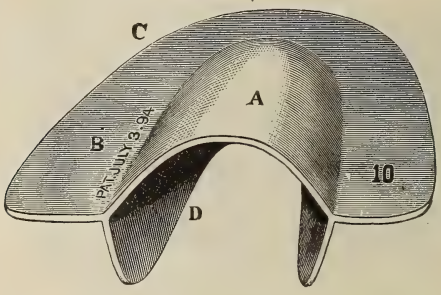
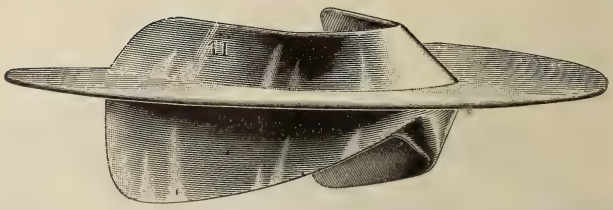


Fig. 15.



nipping forceps (No. 3 mechanical) cut out, as at E E, Fig. 16, and the bite taken as previously described.

For partial lower dentures a lower bite-plate like Fig. 11 may be cut, as shown in Fig. 17.

For instance, take a case like the model shown in Fig. 18. A sheet of thick tin foil or pattern tin is to be cut to about the size of a bite-plate (Fig. 1), placed in the mouth, and with the forefinger rubbed onto the gum-ridge and around the cuspids, to show their relative positions. This rude pattern, laid on an upper bite-plate, will indicate the portions to be cut out, as at E E, Fig. 16. The bite-plate may be sheared to shape, and the bite-plate, by trials in the mouth, be quickly shaped to receive the wax for getting the bite-gauge, as shown in Fig. 19. This, when removed from the mouth,

will appear as seen in Fig. 20. When the additional wax for modeling and contour has been supplied, and a roll of warmed wax placed on the bite-plane, the bite may be taken and result as shown in the sectional view, Fig. 21, and the articulated models seen in Fig. 22.

Another like instance is illustrated in Figs. 23, 24, and 25.

There is a class of cases in which the provision of partial dentures embracing only molars and bicuspids taxes the skill of the prosthetist in no slight degree.

This is especially true in the construction of bridge dentures which are to span spaces between molars and bicuspids or molars and cuspids. For the convenient taking of impressions for these dentures, Dr. H. H.

Fig. 16.

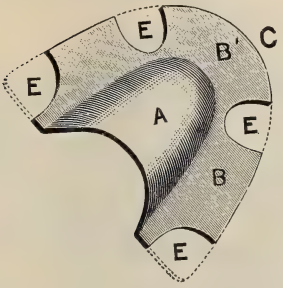


Fig. 17.

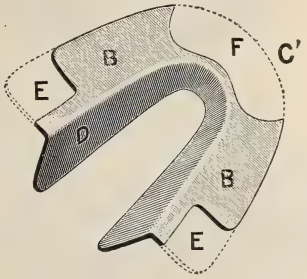
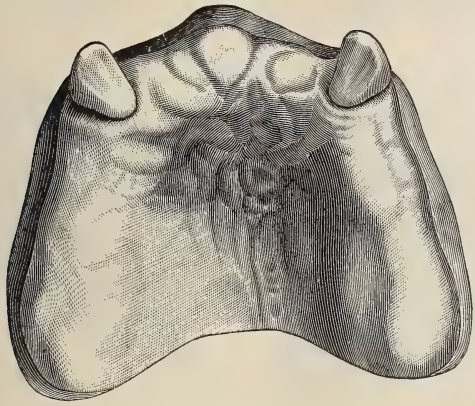


Fig. 18.



Burchard has designed two suitable trays (Figs. 26 and 27), which have dual functions, that shown by Fig. 26 serving for either the upper left or the lower right side, while that illustrated by Fig. 27 may be used for either the upper right or the lower left side, as the case may require.

The True Bite-Plate series are supplemented with the novel forms (numbered 12, 13, 14, 15) shown in Figs. 28, 29, 30, 31. These partial bite-plates are adapted for interchangeable uses,—Fig. 28 for the lower left or the upper right side, and Fig. 29 for the upper left or the lower right side.

For example, a case may be taken in which only the third molar and the first bicuspid, with the oral teeth of the lower right side, remain.

Fig. 19.

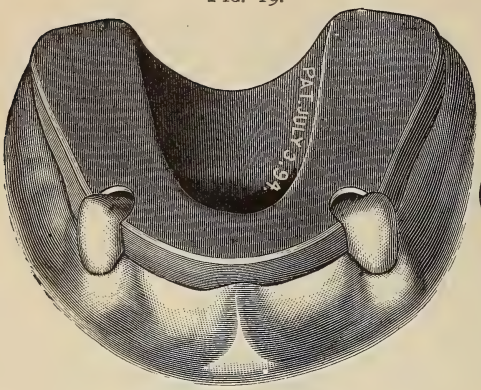


Fig. 20.

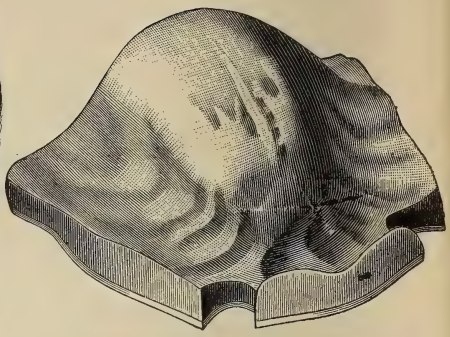


Fig. 22.

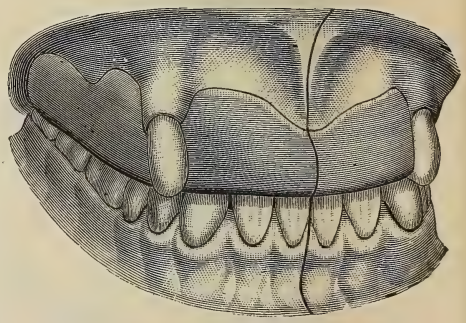


Fig. 21.

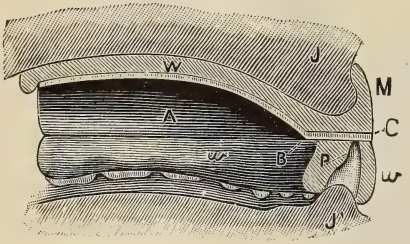


Fig. 23.

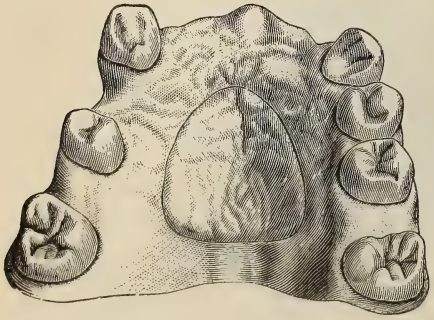


Fig. 24.

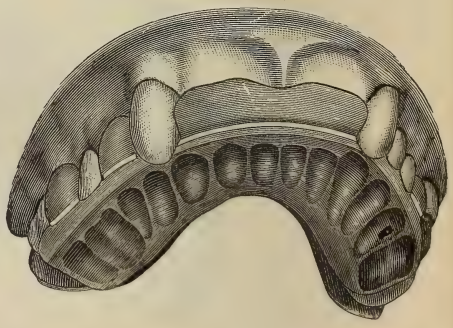
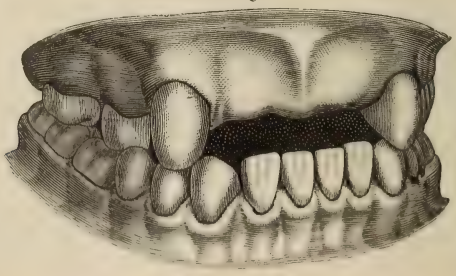


Fig. 25.



Immediately after taking the impression with the Fig. 26 tray, the bite-plate Fig. 29 (No. 12) is to be tried in the mouth, and if necessary, trimmed or bent to rest loosely on the gums, between the lower and right third molar and first bicuspid. The teeth are then occluded to make evident the non-impingement of the upper teeth upon the bite-plate at any point.

Some thinned warm wax is to be placed on the under side of the warmed bite-plate, which is then pressed into place as shown in Fig. 32, and the teeth again brought together, to be sure that they do not strike the bite-plate.

A sufficiently large roll of warmed wax is then placed on the *dry* bite-plate, between the molar and bicuspid, and the upper teeth carefully closed upon and into it, as in Fig. 33.

Fig. 26.

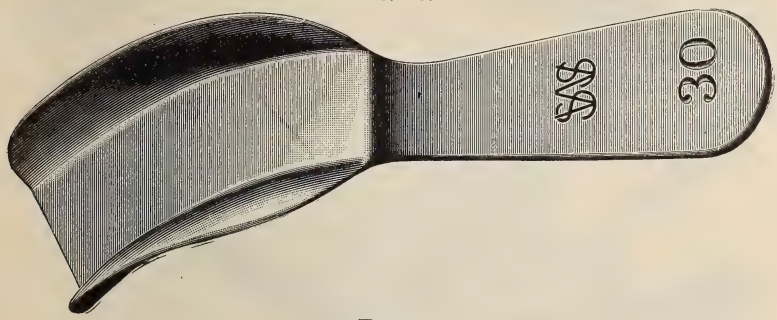
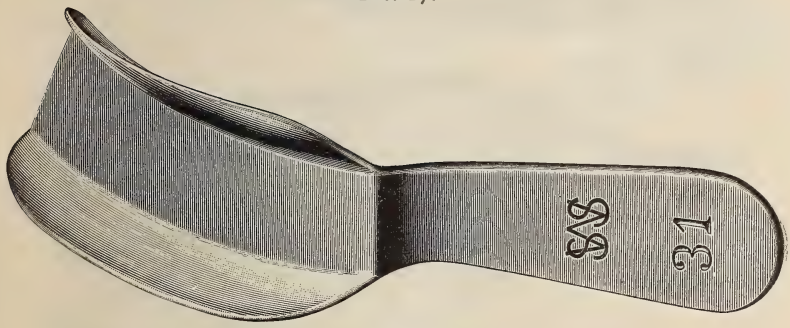


Fig. 27.



While the teeth remain closed, finger pressure on the buccal aspect of the wax will insure its conformation to the buccal surfaces of the teeth. A careful removal of the plate from the widely opened mouth will disclose a perfect bite, as in Fig. 34, which should at once be immersed in cold water and kept there until a plaster model shall have been made from the impression. The bite-plate and bite may then be judiciously placed on the model and both transferred to the articulator, with the result shown in Fig. 35. The like process is pursued in obtaining the bite at the original sitting for the impression in any similar case, whether the space to be filled is located above or below on either side. If the space extends only between, say, the second molar and first bicuspid, the partial bite-plate Figs. 30 or 31 (No. 15 or 14) may be used.

The anterior or bicuspid part need seldom be changed, but in every instance the bite-plate should be tried in and the upper teeth be closed, to be sure that they do not touch the bite-plate. The handle can easily be bent laterally to meet any indication. The thin sides may be readily flared by hand pressure over a smooth, round wooden handle to widen any part

Fig. 28.

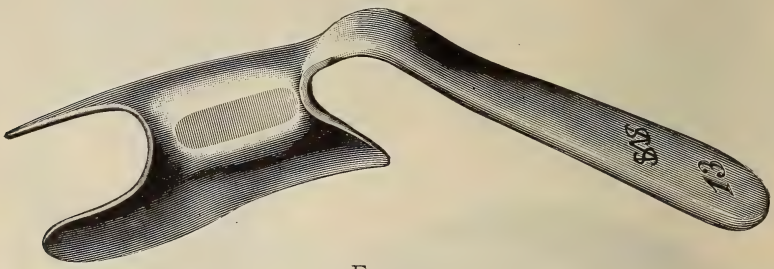


Fig. 29.

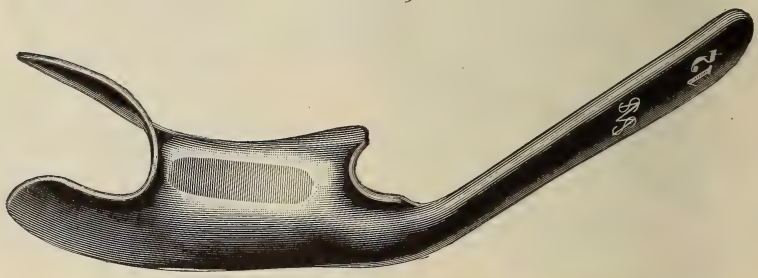


Fig. 30.

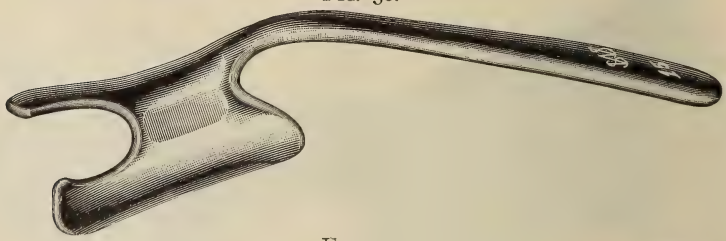
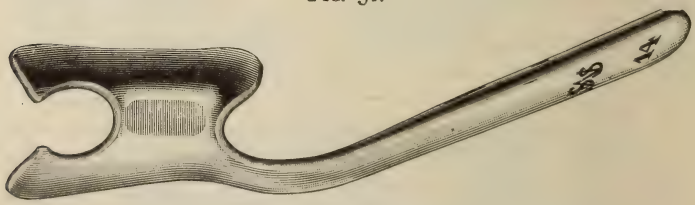


Fig. 31.



of the bite-plate to suit a special case. The ends and edges of the sides can be trimmed off to suit flat gum-ridges or close bites, the bite-plates, in form and amplitude of thin metal, having been made with a carefully considered design to provide for facile adaptations to the exigencies of prosthetic practice in this class of cases.

FIG. 32.

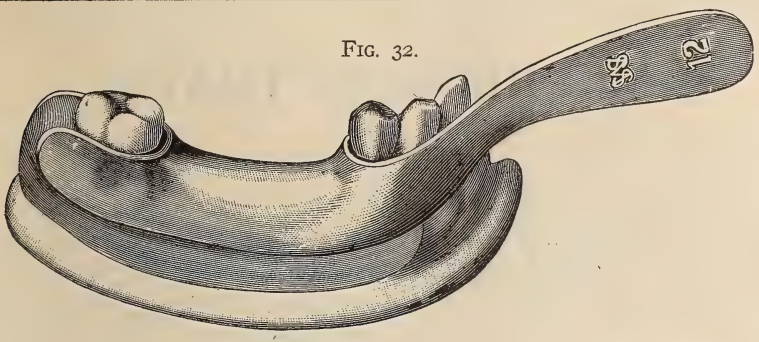


FIG. 33.

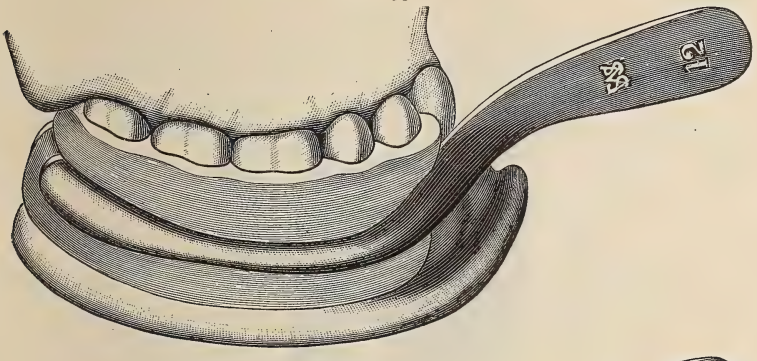


FIG. 34.

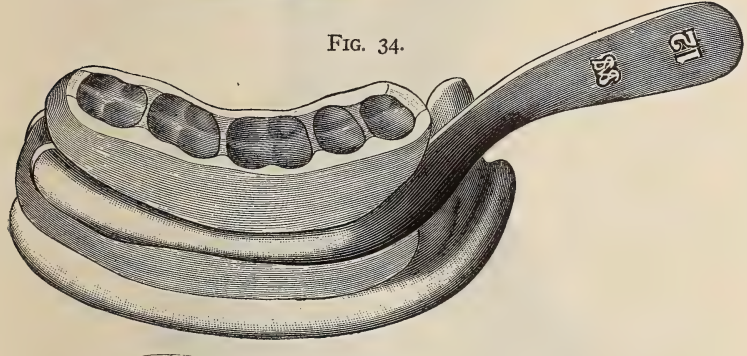
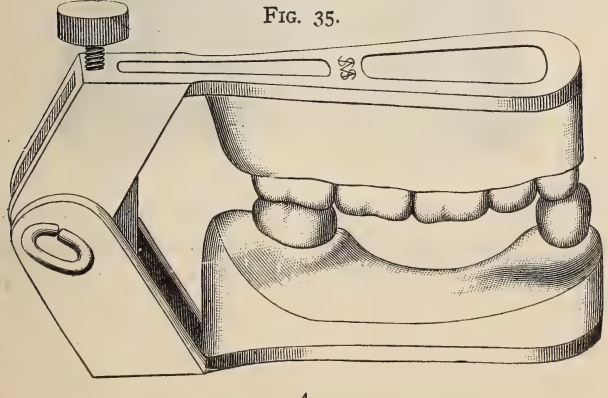


FIG. 35.



IMPRESSION TRAYS.

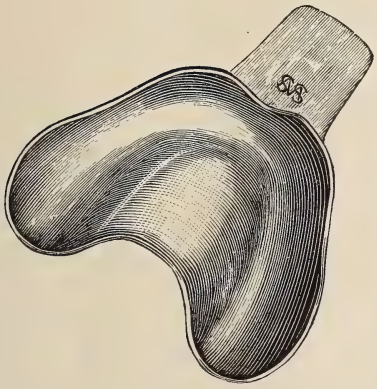
The original set of these Britannia Impression Trays were designed especially for the late Dr. S. S. White in 1871. From time to time since, additional forms for special conformations and conditions, and for partial work, have been added, as the need for them was developed, until now the line affords the means for taking any impression likely to be met with in practice.

All our Impression Trays are made of britannia-metal, of the best quality, and of uniform thickness. They are light enough to allow of alteration with pliers or mallet, or for many cases with the fingers, so as to adapt them to any peculiar formation of the maxilla. They are superior in form and finish.

Putting a hole in the handle of an Impression Tray is not a very great invention, but it makes a great convenience—affords a handy means for hanging the Tray up. Our entire line of Impression Trays are made with this convenience.

UPPER IMPRESSION TRAYS.

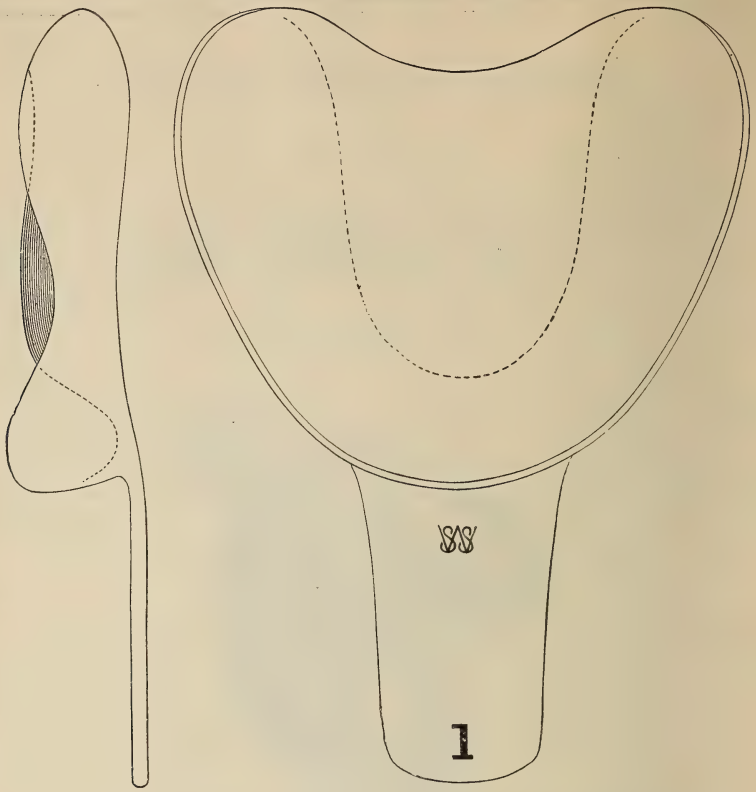
FORM A.



Form A illustrates the shape of a set of eight, Nos. 1 to 8, for Full Upper Dentures. Special attention is invited to the peculiarities of these forms, which we introduced many years since,—to the dip at the sides, to accommodate the prominences of the malar processes, and in front to avoid the labial frænum; and to the length (1½ inches) and position of the handle, which, being below the line of the base, gives more room for the lip.

The exact size of each Tray of the set is outlined, with its number, by which it may be ordered. The side views show, by the dotted lines, the height of the palate portion of the Tray.

Price, Upper Trays, Nos. 1 to 8.....each $0.25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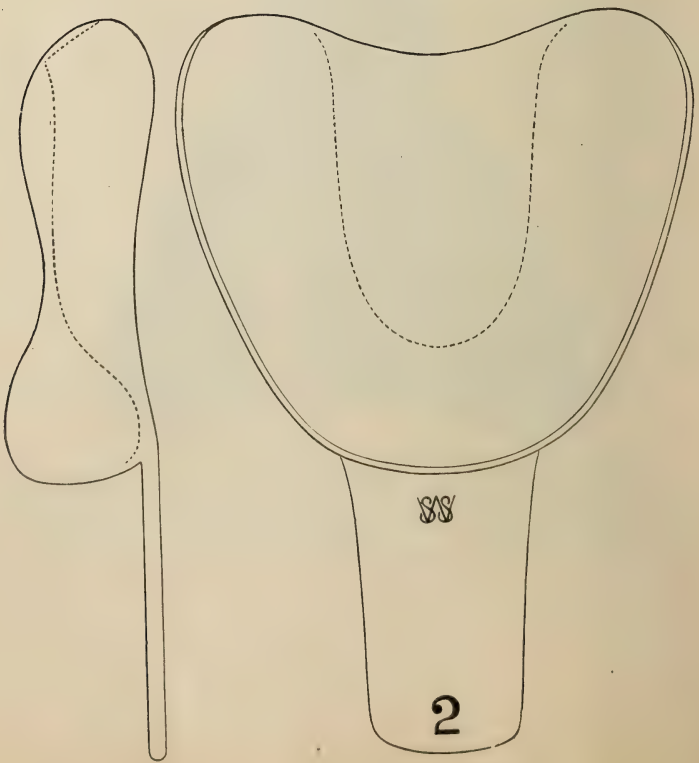
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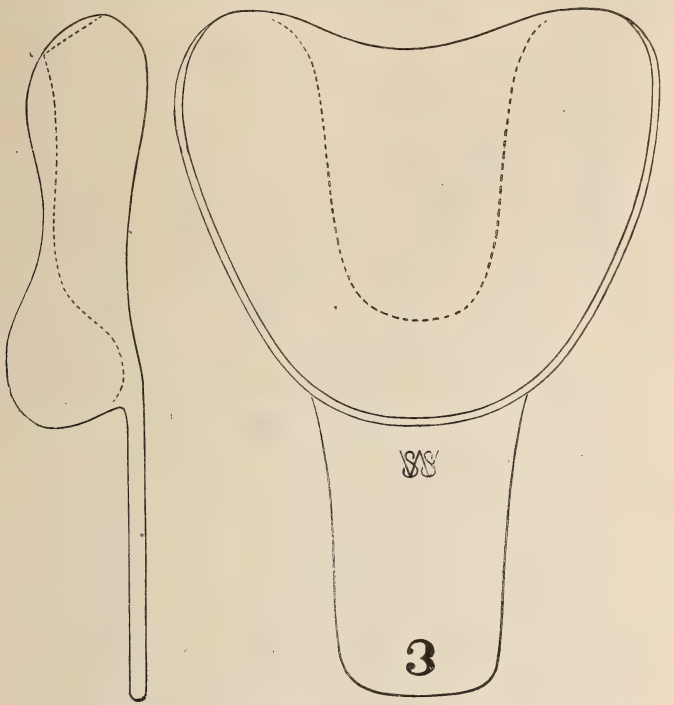
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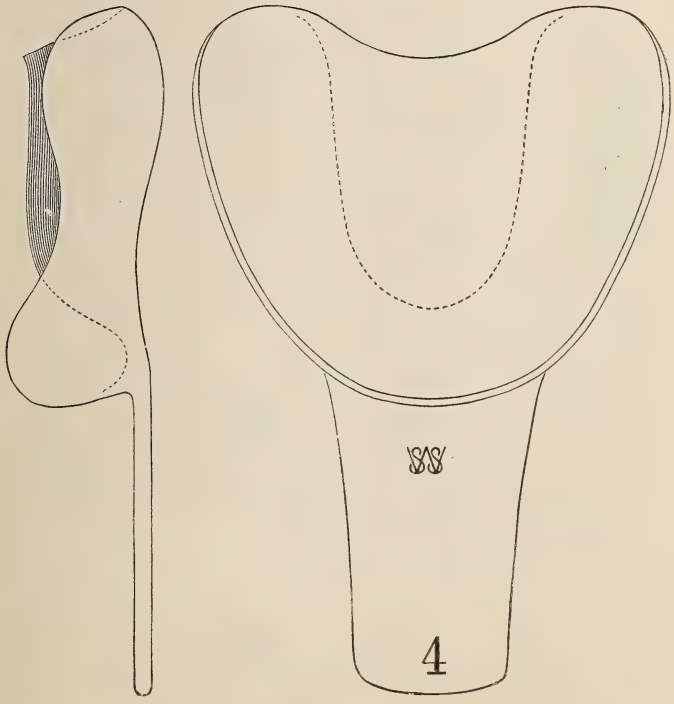
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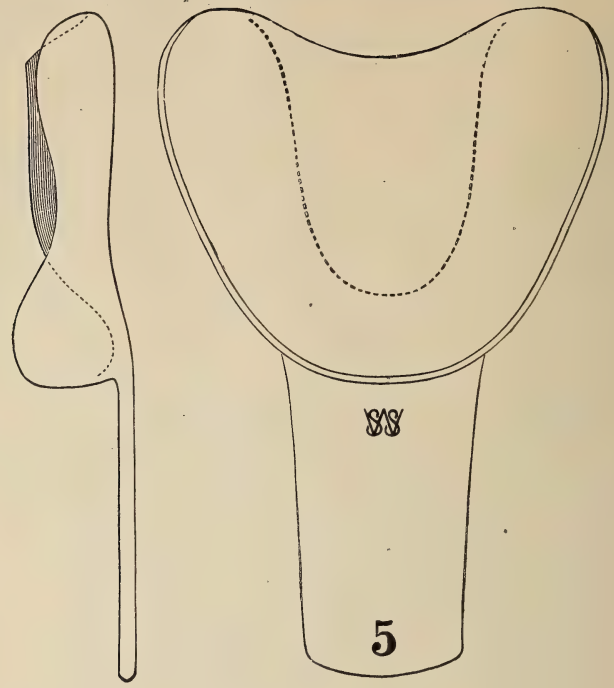
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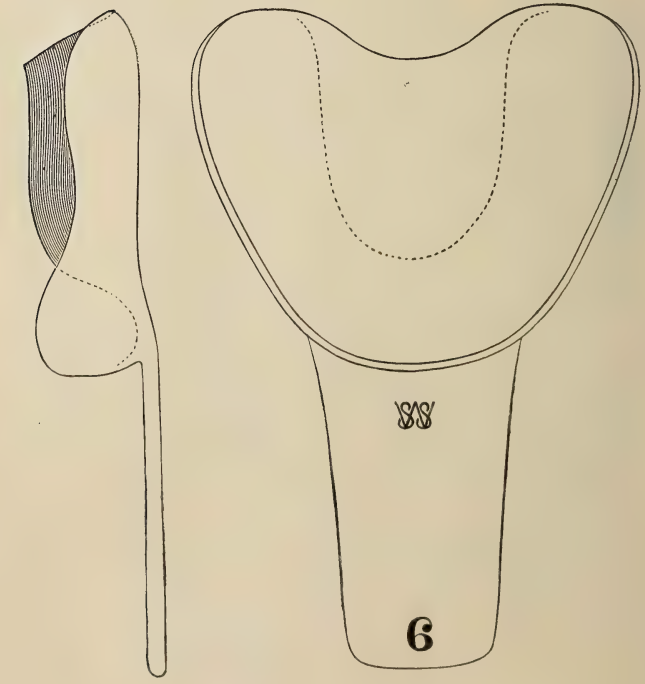
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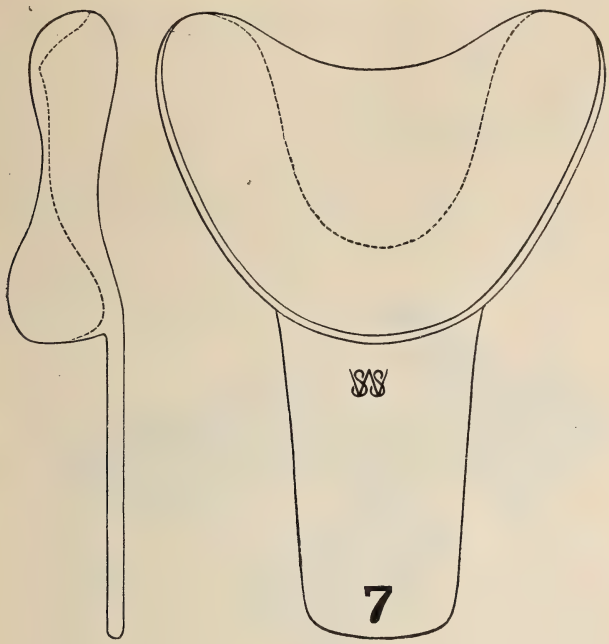
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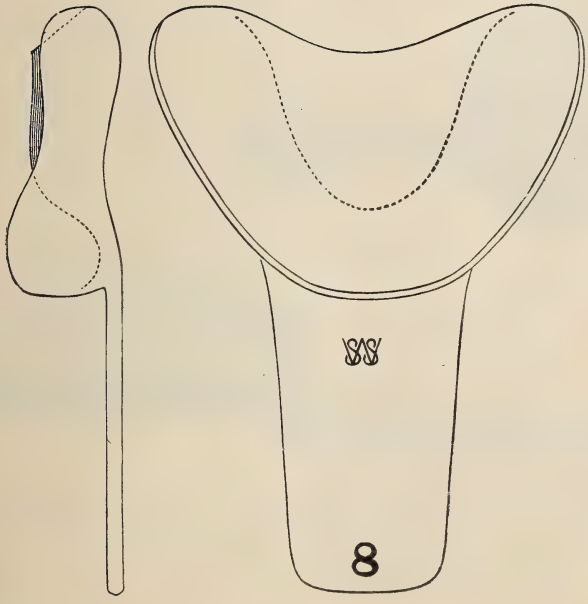
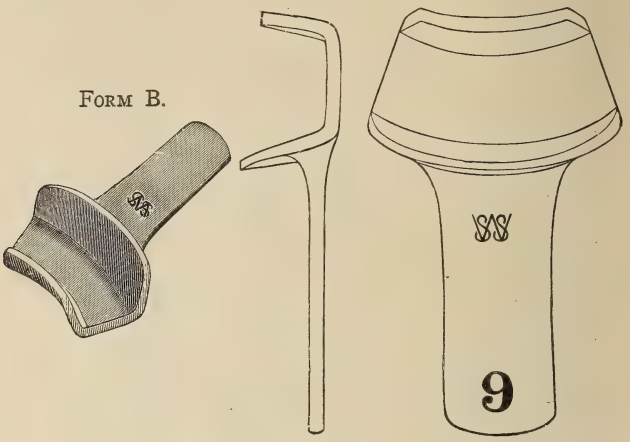

8

PARTIAL UPPER TRAYS.

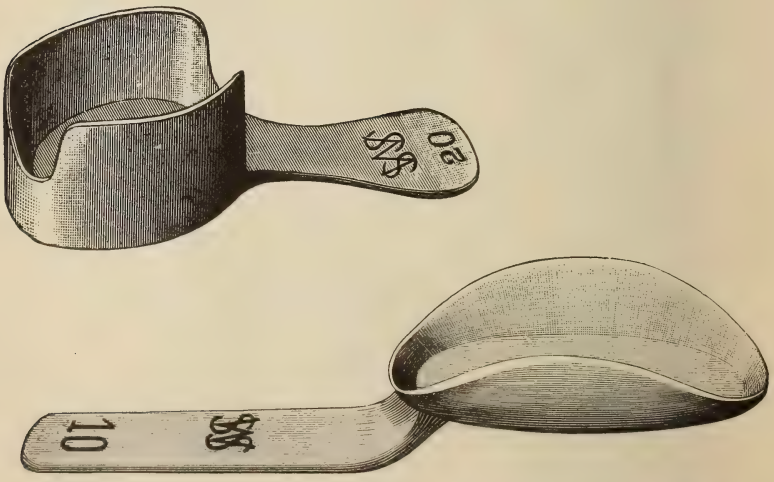
Form B illustrates a Partial Upper Tray for one or two teeth. Useful in crown- and bridge-work. One size.

Price, Upper, No. 9 (Partial).....$0.20



FORM B.

PARTIAL UPPER OR LOWER TRAYS.



No. 10 suggested by Dr. L. M. Mathews; No. 20 by Dr. Geo. W. Melotte.

These Trays were designed for Partial Cases of every description. They are well adapted for use in any part of the upper or lower jaw.

Price, Partial, Nos. 10 and 20.....each $0.25

UPPER IMPRESSION TRAYS.

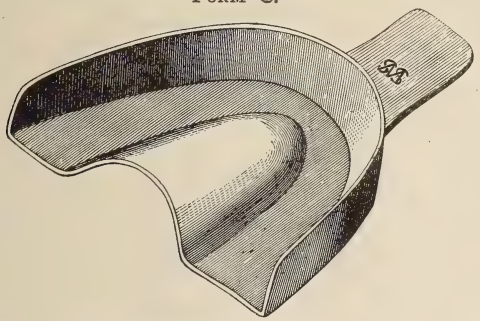
With Flat Bottom and Square Sides.

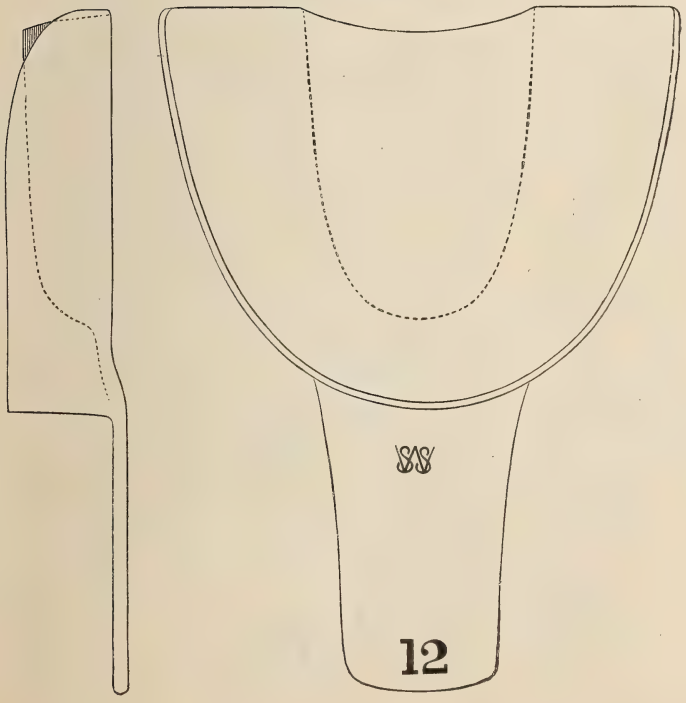
Form C illustrates the shape of a set of five, Nos. 12 to 16 (for Partial Upper Dentures), with flat bottom and square sides; the handles, 1½ inches in length, set below the line of the base.

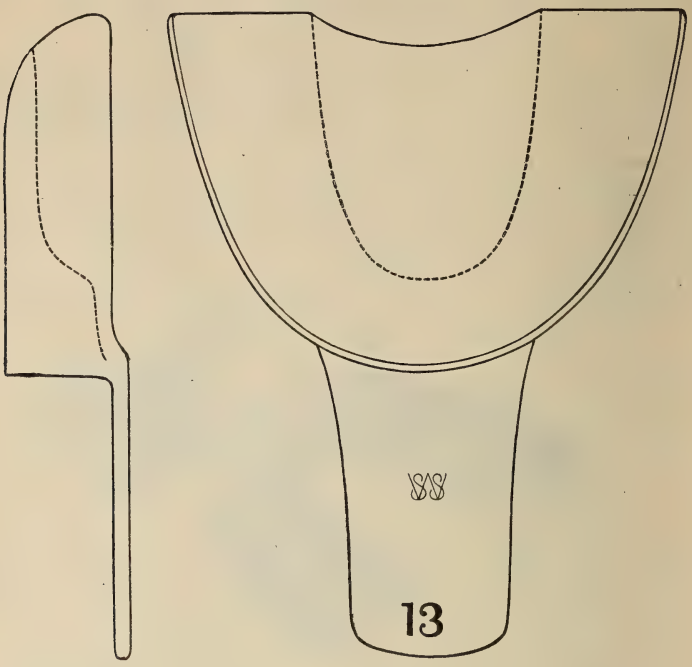
The exact size of each Tray of the set is outlined, with its number, by which it may be ordered. The side views show, by the dotted lines, the height of the palate portion of the Tray.

Price, Upper Trays, Nos. 12 to 16 (Flat Bottom).....each $0.25

Form C.



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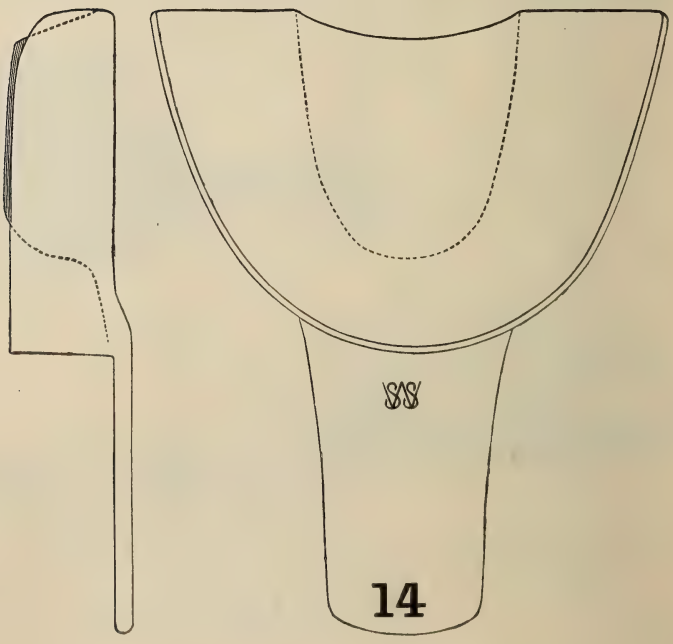
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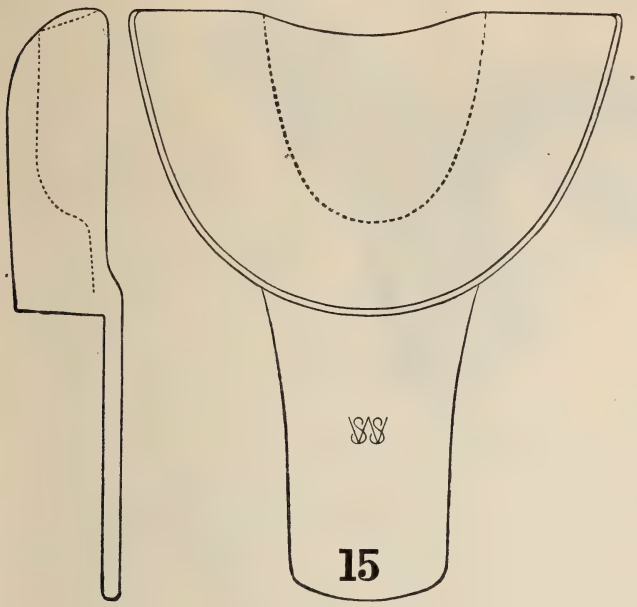
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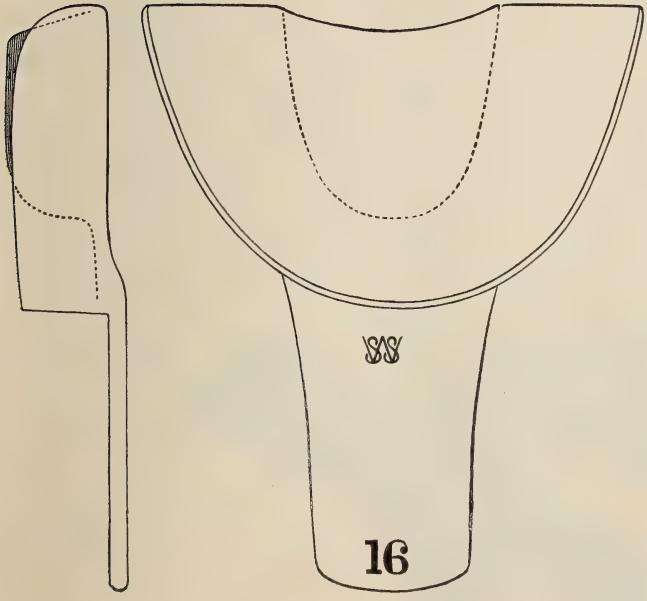
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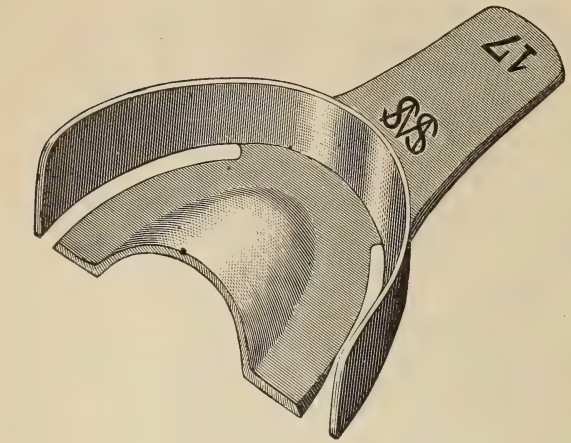
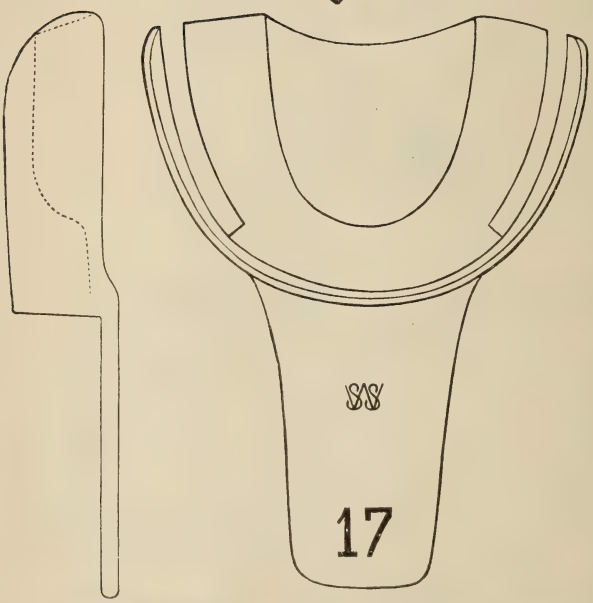
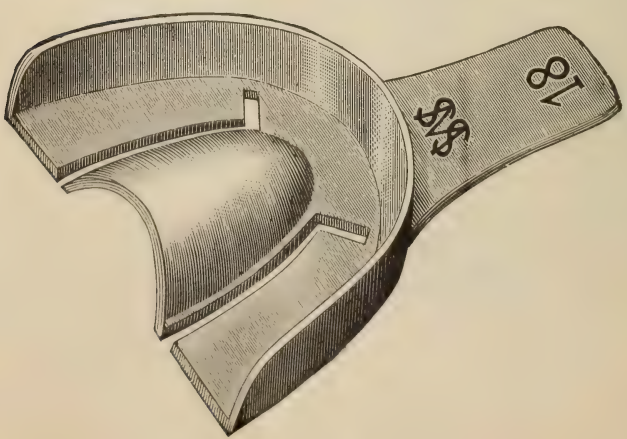
ADJUSTABLE UPPER IMPRESSION TRAYS.

Patented August 24, 1886.







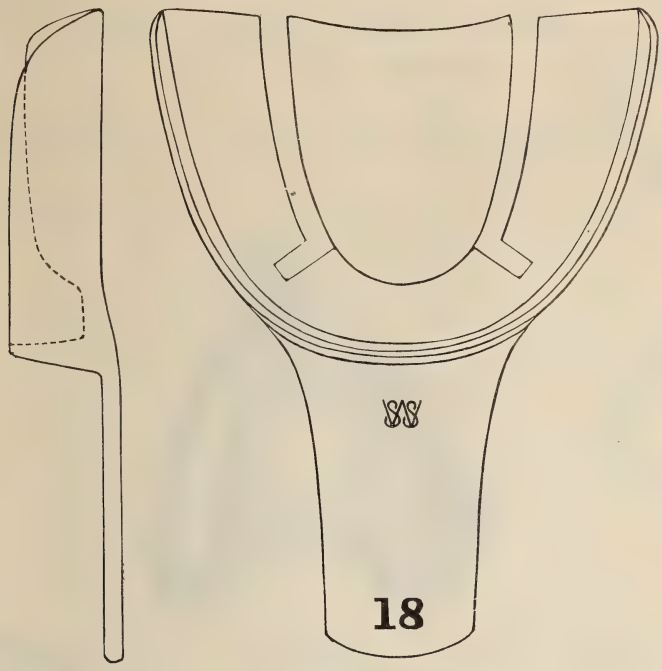
In taking impressions of deep, narrow mouths, or where a masticating tooth standing alone widens the jaw at a particular point, it is sometimes desirable to be able to readily adjust the size and shape of the Tray used.

Nos. 17, 18, and 19 were designed to meet this want. In No. 17 the side walls are cut free from the bottom, and in Nos. 18 and 19 (suggested by Dr. J. K. Wiley) the palatine portion is cut free, with slots running across the bottom toward the rim, for easy adjustment.

Each of these Trays is stiff enough for ordinary uses, yet can be quickly bent, compressed, twisted, or cut away to meet emergencies or unusual presentations of the teeth, gums, or palatine arch. Their great facility of adjustment renders good impressions possible in difficult cases without loss of time.

PRICE.

Upper Trays, Nos. 17, 18, 19 (adjustable)..each $0.35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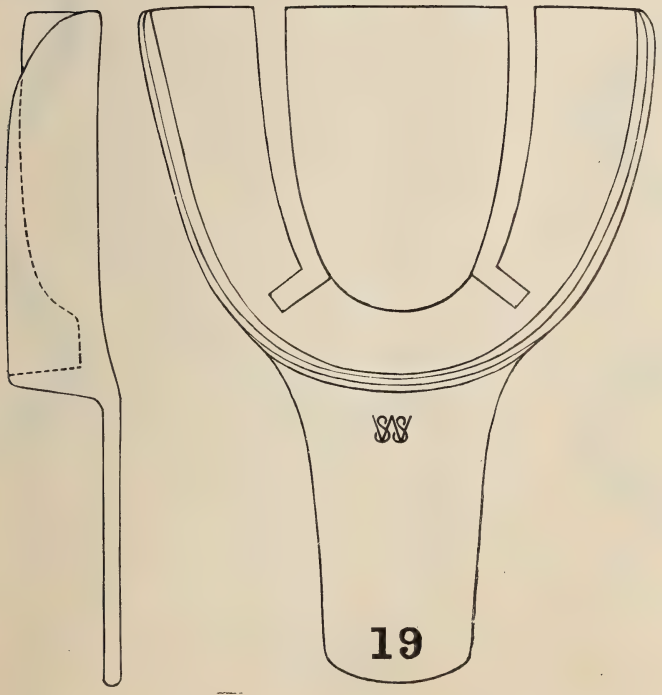

19

UPPER IMPRESSION TRAYS.

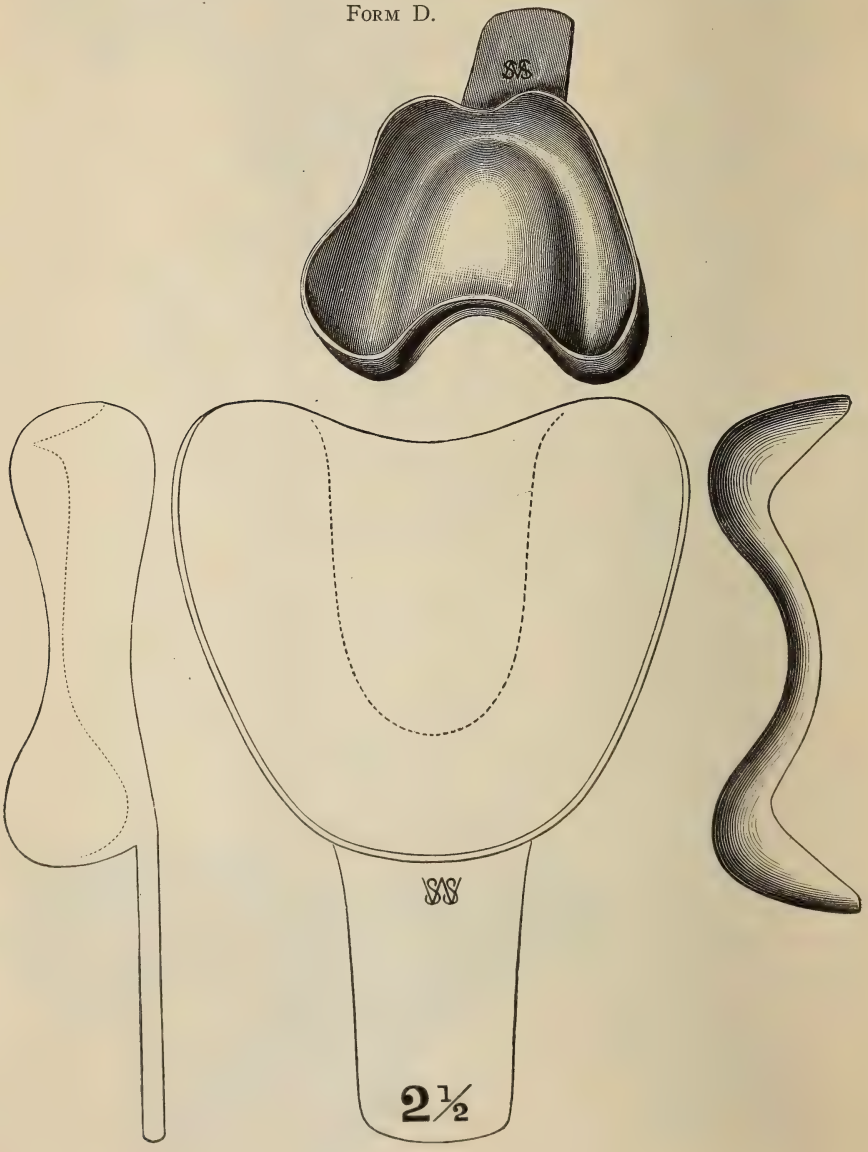
Specially adapted for Plaster.

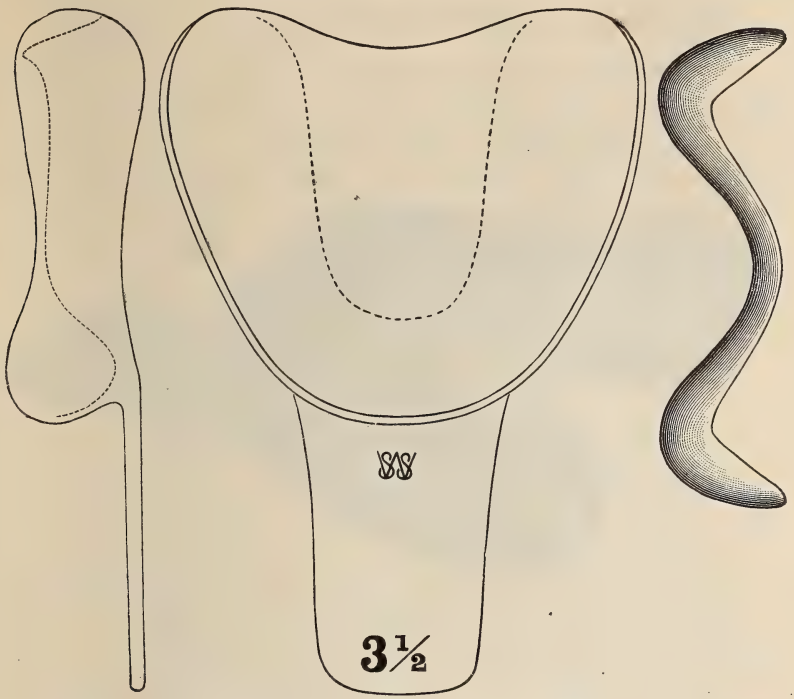
Suggested by Dr. A. P. Southwick.

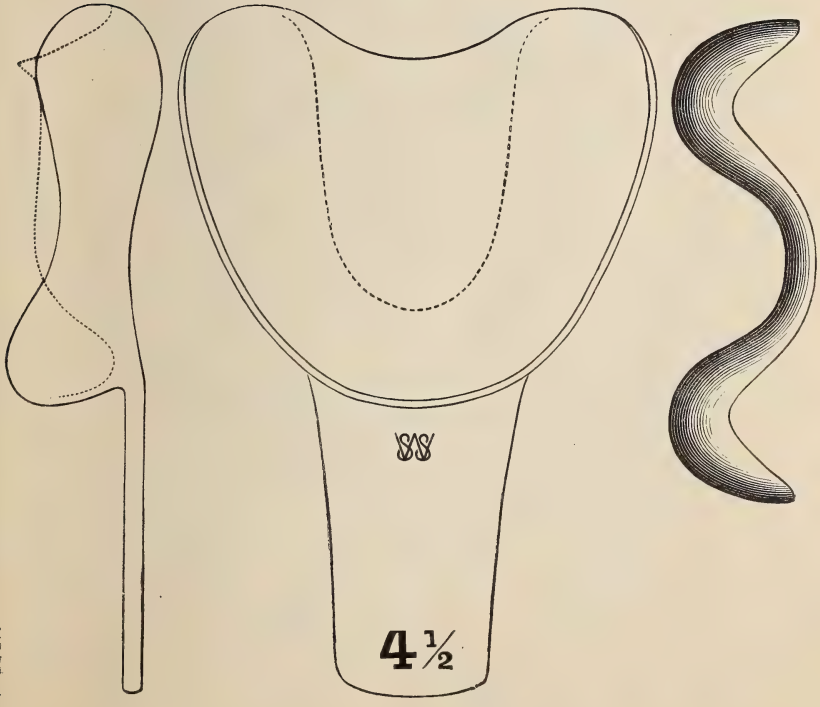
Form D illustrates a set of three, Nos. 2½, 3½, and 4½, for Full Upper Dentures, with raised palatine edges, which prevent the plaster slipping off the Tray.

Price.....each $0.25

Form D.



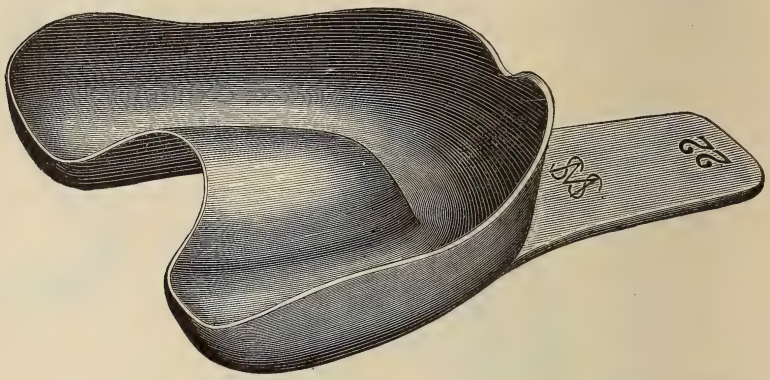

3½

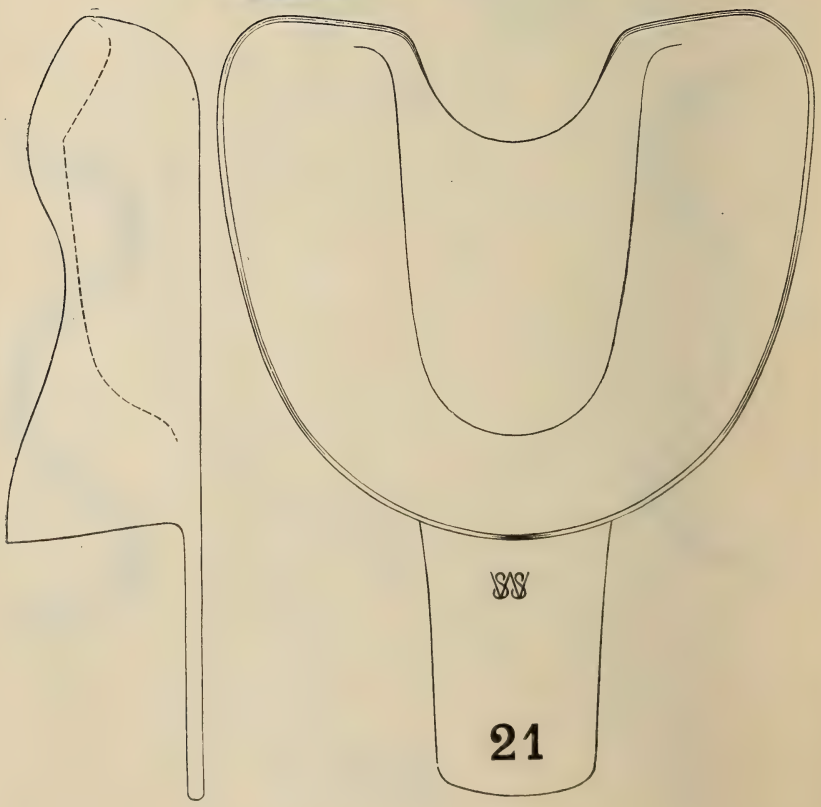

4½

ANGLE'S UPPER IMPRESSION TRAYS.

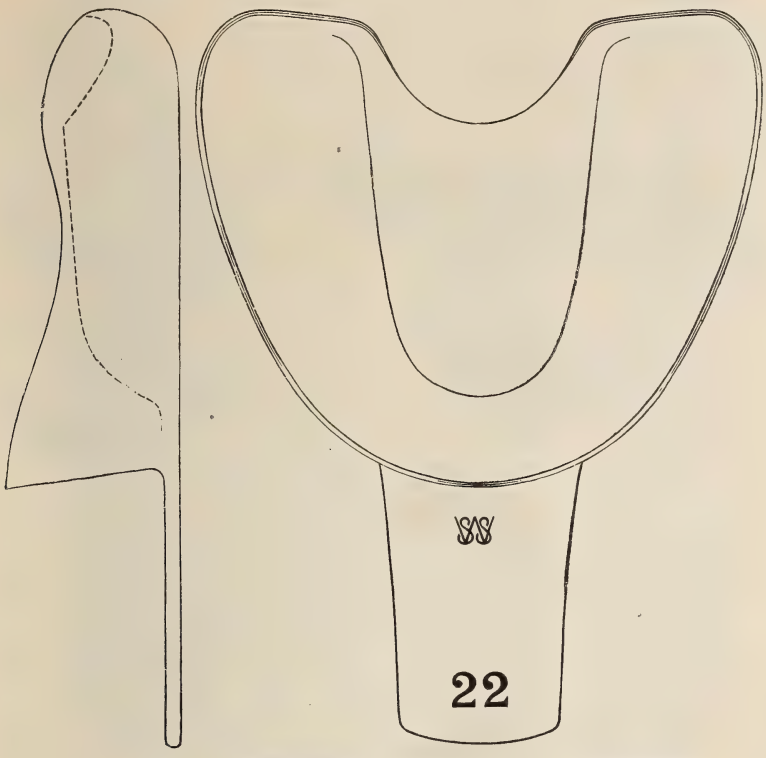
These Impression Trays are designed especially for use in obtaining impressions in cases of irregularities. The Trays are of such shape and height that it is only necessary to evenly fill them with plaster, leaving but very little surplus material to cause annoyance.

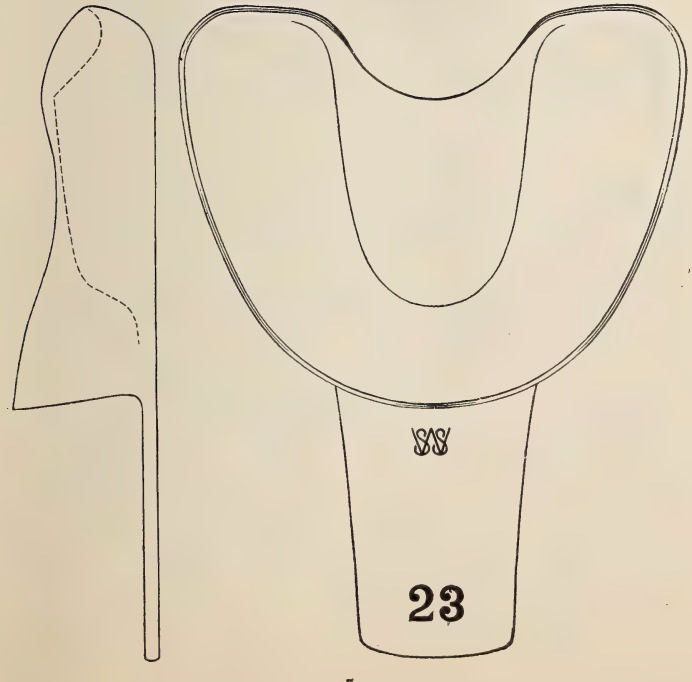
Price, Angle's Upper Impression Trays, Nos. 21, 22, and 23, each $0.35





ANGLE'S UPPER IMPRESSION TRAYS.





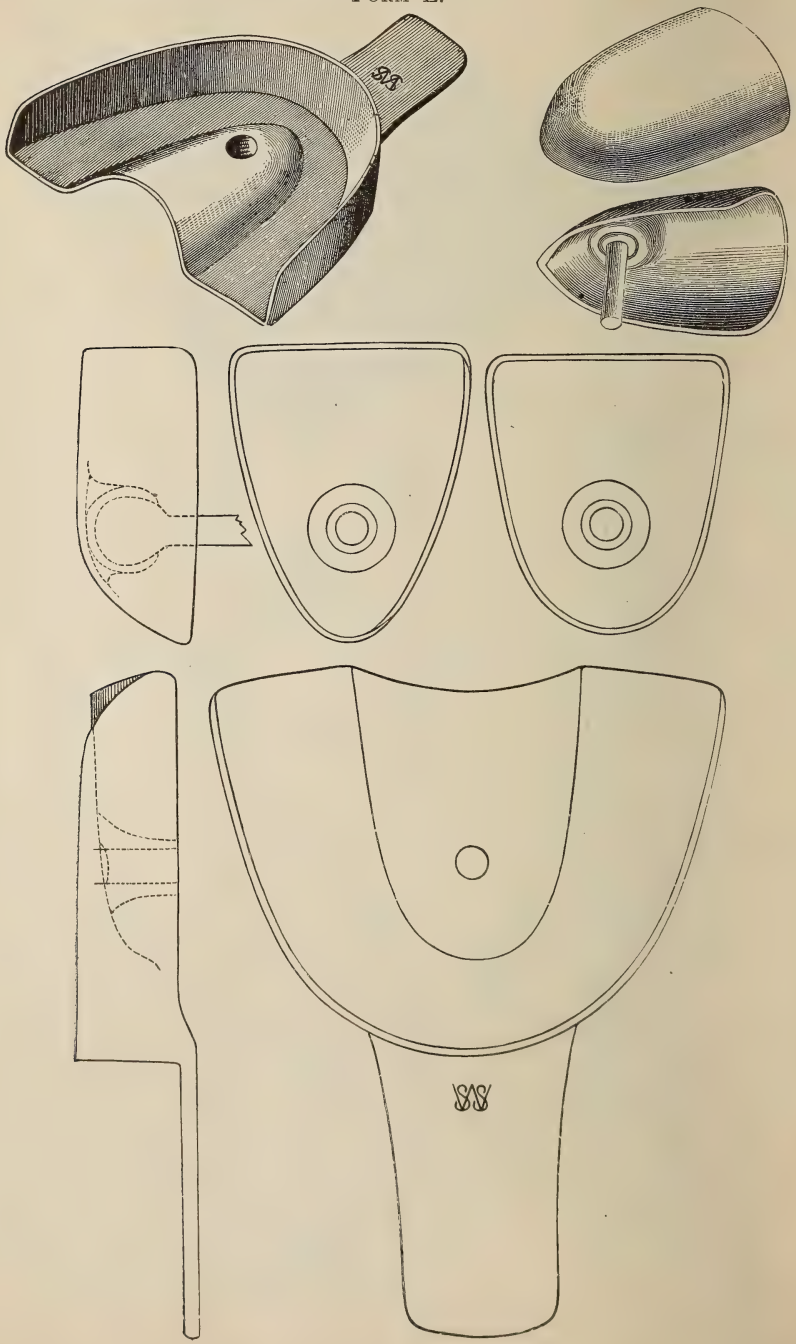
MOVABLE PALATE-PLATE TRAY.

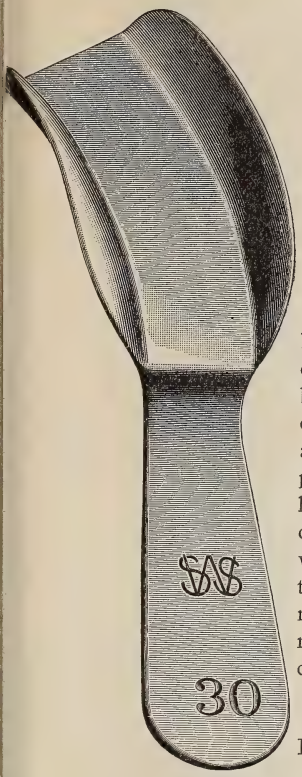
Suggested by Dr. Thomas Wardle.

Form E illustrates the movable Palate-Plate Tray.

Price of Tray, with two Palate-Plates, complete.....$1.00
" " " without Palate-Plate..... .35
" " Palate-Pieces .....each .35

Form E.





PARTIAL IMPRESSION TRAYS.

Suggested by Dr. H. H. Burchard.

These two new forms of Partial Impression Trays will be found especially useful in cases where spaces intervene between molars and bicuspids or molars and cuspids. They are designed for taking impressions of both upper and lower partials, and are especially adapted for bridge-work cases; No. 30 for either the upper left or the lower right, and No. 31 for the upper right or the lower left, as the case may be.

PRICES.

Partial Impression Trays,
Nos. 30, 31.....each $0.25

WAXED CLOTH FOR BASE-PLATES.

Patented June 28, 1898. D. R. G. M. No. 97,461.

Waxed Cloth is Extra Tough Pink Paraffin and Wax reinforced with a sheet of Cloth on one side, the two being so attached that, while they can be separated without great difficulty, they are not at all likely to come apart in use.

The addition of the Cloth makes the Wax stiff and strong, and less liable to change form.

It saves the plaster cast from being injured by cutting through or overheating the wax when grinding on the teeth.

There is no need of coating the cast with collodion, as the Cloth side comes next to the plaster and separates from it easily.

It is preferable to gutta-percha for upper or lower plates. There is no crawling or shrinking when warmed by lamp or hot water for adjustment to the cast.

Put up in sheets about 3 x 5½ inches, 18 sheets to the box.

Price.....per box $0.75

LOWER IMPRESSION TRAYS.

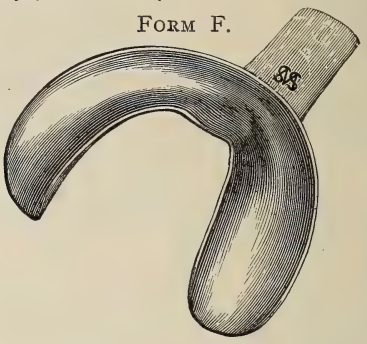
Form F illustrates the shape of a set of seven, Nos. 1 to 7, for Full Lower Dentures. The handle is 1¾ inches in length, and so curved as to raise it three-eighths of an inch above the base, giving room for the lip, and allowing the Tray to sit down well on the maxilla. The inner line is shaped to avoid the lingual frænum.

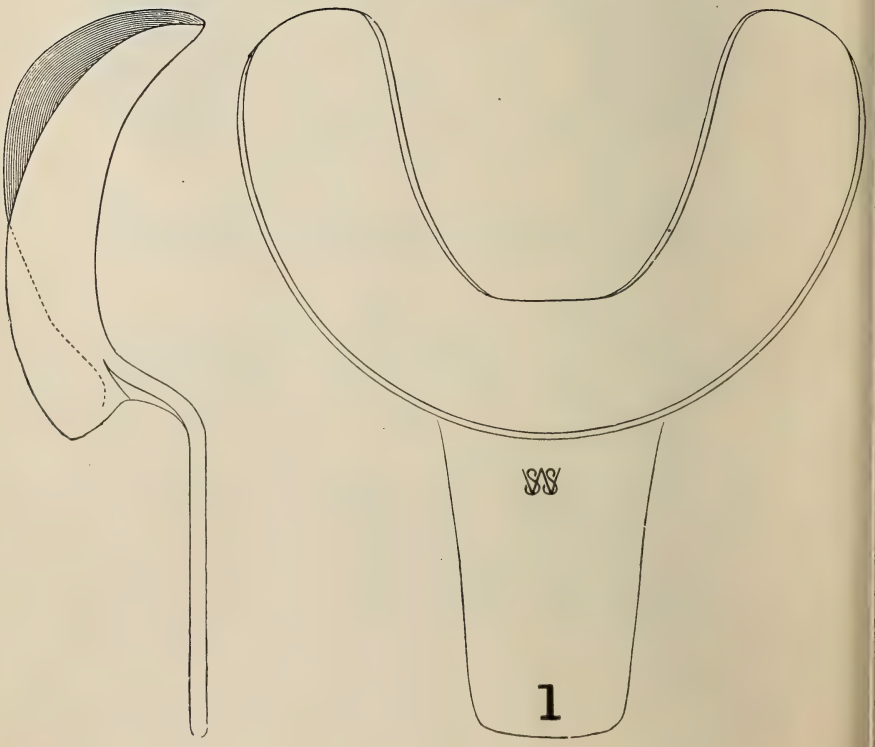
Nos. 5 and 6 are specially designed for cases where great absorption has taken place, and the muscles of the mouth are on a level with the maxillary ridge.

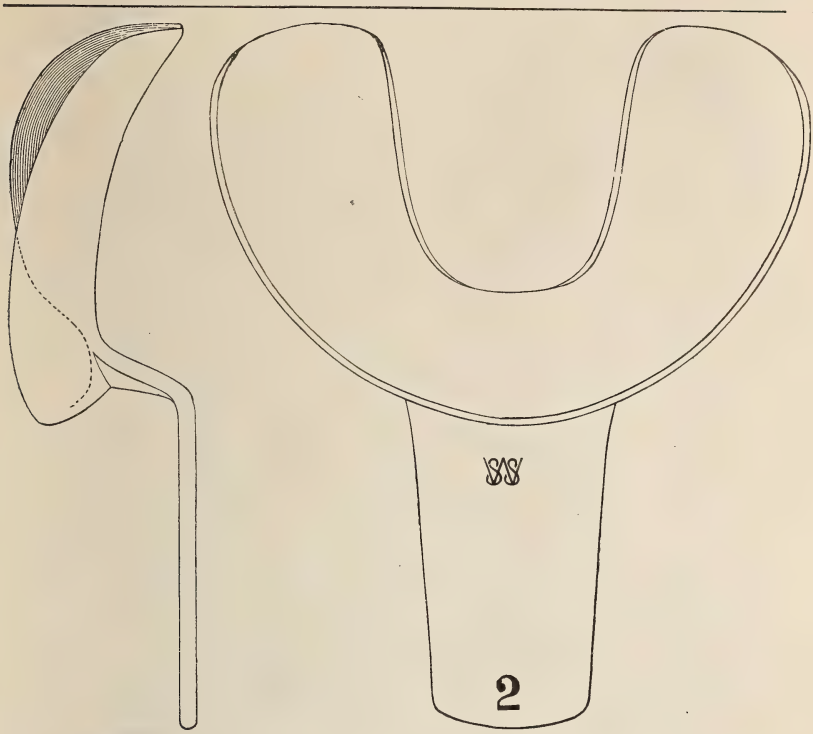
The exact size of each Tray of the set is outlined, with its number, by which it may be ordered. The side views show, by the dotted lines, the relative dip of the outer and inner edges of the Tray.

Price, Lower Trays, Nos. 1 to 7.....each $0.25

FORM F.



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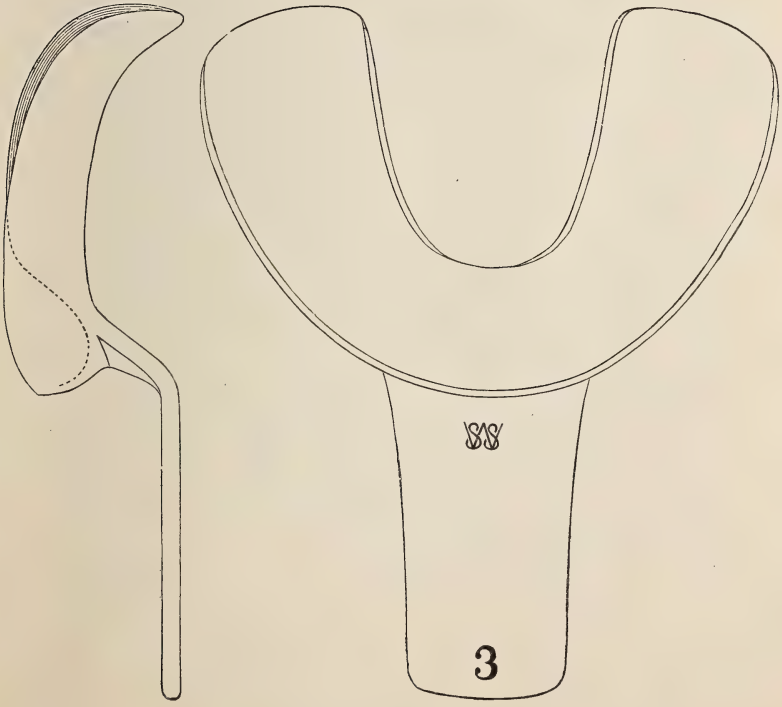
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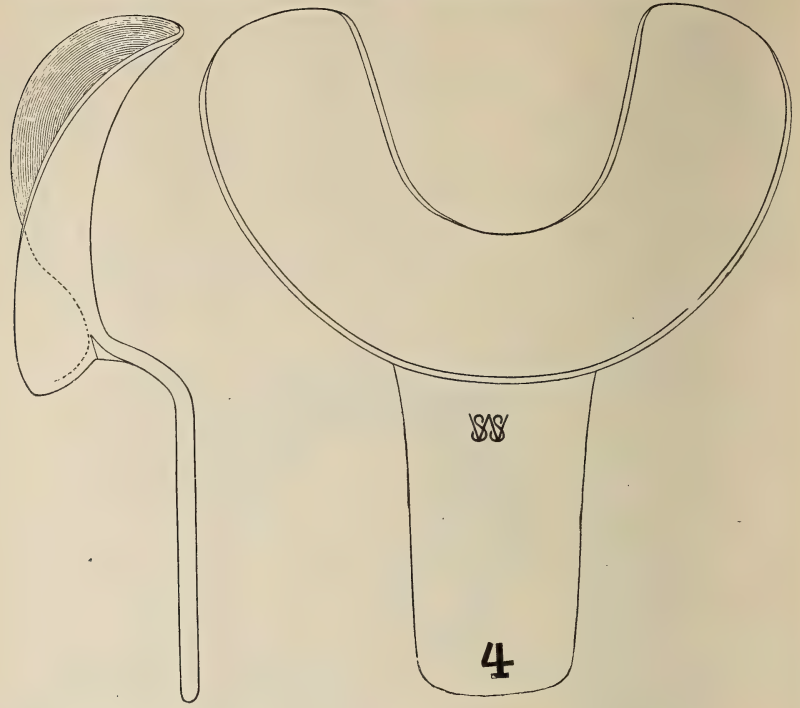
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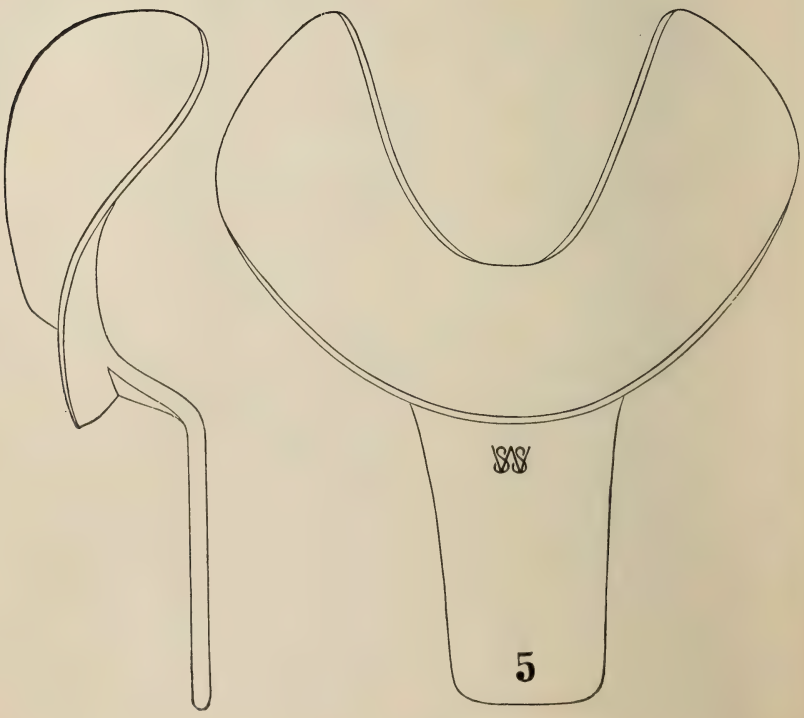
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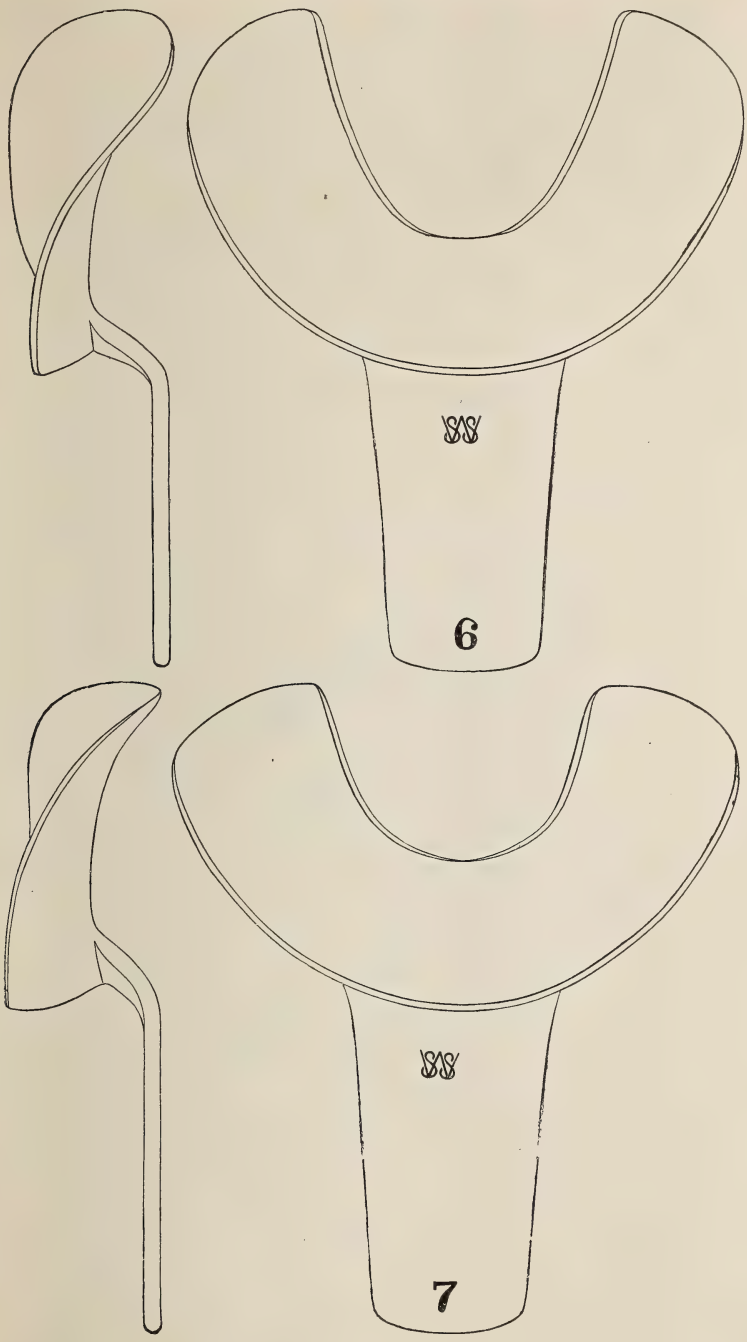
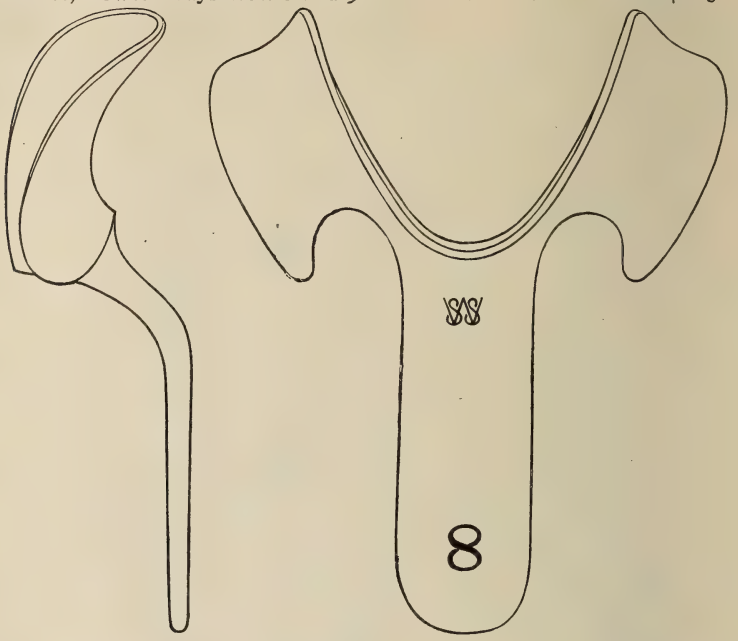
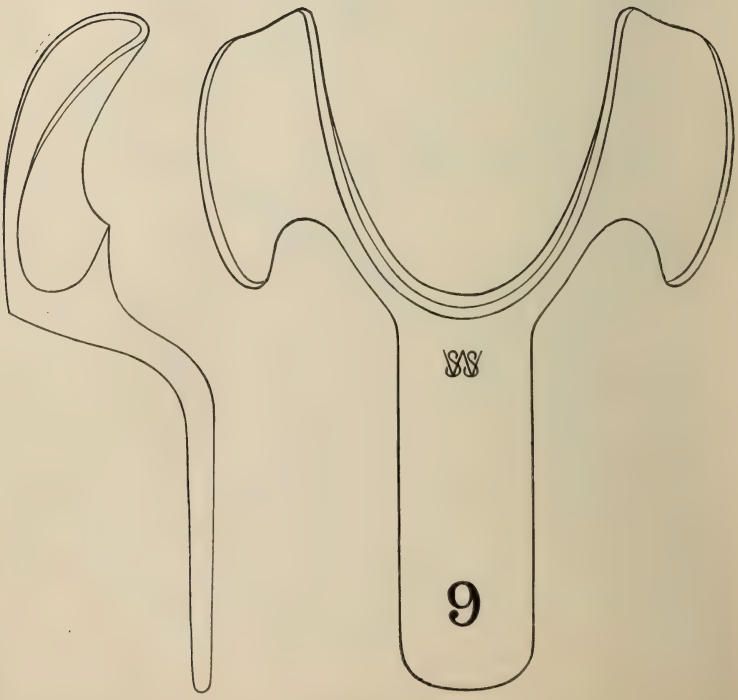

6
7

Partial Lower Impression Trays for Undercuts.

In Impression Trays Nos. 8 and 9, from patterns furnished by Dr. C. F. Rich, the rim adjoining the handle is cut away, allowing it to be placed in the mouth with the impression-material in it, and pressed downward and forward against the front teeth, procuring a perfect impression of undercuts or shelving gums.

Price, Lower Trays Nos. 8 and 9.....each $0.25





Revision of Prices, etc.

Page 50.—Impression Trays.

We state in the text that all our impression trays are made of britannia metal. The new trays, Nos. 40 to 43, are of stamped brass and are nickel-plated.

Page 94.—Melotte's Moldine.

Complete outfit reduced to $1.00
Moldine (half-pound) reduced to ..... .25
Fusible metal (ingots) " ..... .25

Page 103.—Wax Spatulas.

No. 28 reduced to ..... each .50

Page 106.—Crown Articulator, No. 5.

Now made of wrought metal, price advanced to ..... " .40

Page 110.—Sump.

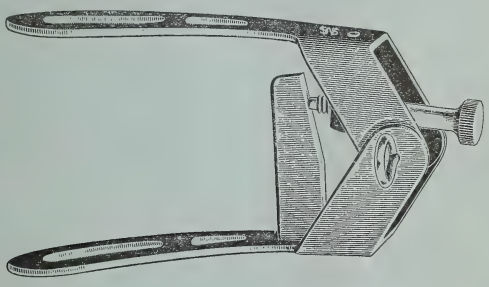
We are now selling Sump in ¼ barrels at 15.00

Fourth Cover.—Poulson's Shaded Pink Rubber.

Should read No. 1 Light and No. 2 Medium, price ⅛-lb. packages ..... each 1.50

ARTICULATOR No. 9.

Suggested by Dr. P. G. C. Hunt. Modified by Dr. Jas. F. Gwinner.



The Hunt Articulator for crown- and bridge-workers filled a long-felt want so well that it made a place for itself at once.

Here is another Articulator of the same general character, but which has several improvements. The jaws are slightly curved instead of straight, so that it can be used for partial anterior cases as well as for posterior. The set-screw is placed at the end instead of on top, so that it is out of the way in manipulating, and is not liable to be clogged with plaster when the model is run. Both lingual and buccal or labial surfaces of the model are exposed to view.

Articulator No. 9 will be found of almost universal application in partial articulations, and will be especially useful to crown- and bridge-workers.

Price $0.50

ADDITIONAL WAX SPATULAS.

No. 30.
By Dr. L. P. Haskell.

Wax Spatula, No. 30.

Dr. Haskell has long been regarded as one of the most skillful prosthetic dentists. This Spatula for shaping and carving the wax is an important appliance in his methods. It represents his idea of the most useful form. The working blades are rather narrow, one straight, one curved, with spear points. The handle is rather heavy, of knurled steel. We have made this Spatula for years on special orders and to supply the students in his classes and others who had been impressed by Dr. Haskell's descriptions of his methods. It is now placed regularly before the profession, as No. 30 of our line of Spatulas.

Price, Wax Spatula, No. 30.....$0.50

Wax Spatula, No. 31.

Dr. Gritman's Spatula, it will be observed, has large working blades. The principal use of this Spatula is in waxing up cases for soldering. The broad blades enable the operator to carry a considerable quantity of softened wax from the flame to the model, which cannot be done with small, narrow blades. Then, again, the size enables them to retain the heat better, which will be found to facilitate the work of waxing. The curves of the blades will be found well adapted to the lingual contour of the models. The pointed blade is for waxing between the teeth, either labial or lingual surface.

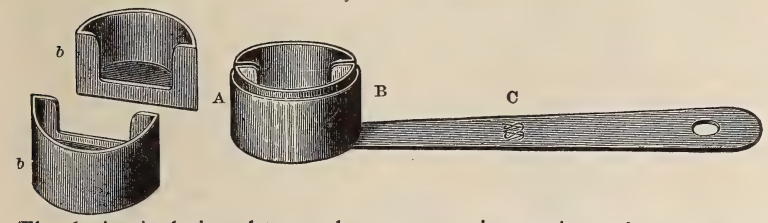
This Spatula will be found to be a very complete all-around appliance for its work.

Price, Wax Spatula, No. 31.....$0.50

No. 31.
By Dr. A. D. Gritman.

PIER IMPRESSION TRAYS.

Devised by Dr. C. P. Wilson.



The device is designed to produce accurate impressions of separated single teeth which are to serve as piers for dental bridges and plates, or for regulating attachments.

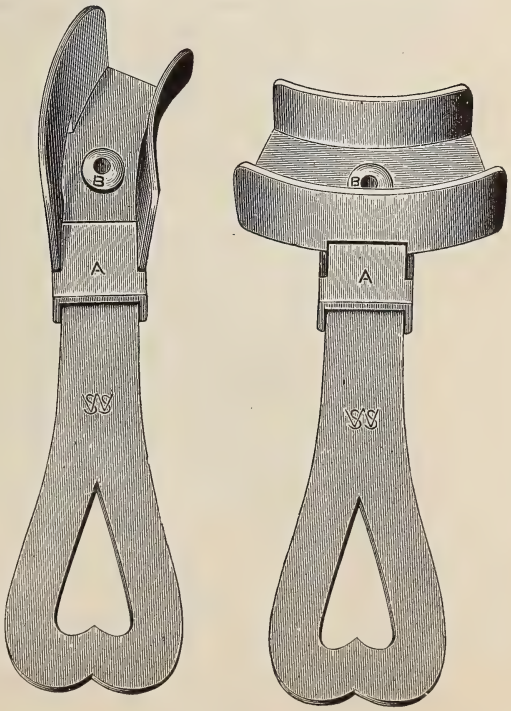
Thick-mixed plaster is to be placed in the Pier Tray, which is then pressed over the tooth. The holder A telescopes upon the trays, from which it is to be slipped by the handle C, leaving the tray upon the tooth. A very thin knife, or excavator, is then pushed between the partial divisions of the tray near its contact with the gum to effect a lateral separation of the two parts of the tray, and the impression. The parts readily separate from the tooth with a line of fracture that enables them to be rejoined and the tray replaced in the holder. This is pivoted so that the dividing line of the tray may be mesio-distal when the handle is turned to a convenient angle for taking the impression, from which a perfect plaster model (or several of them) may be obtained.

At *b*, *b*, are shown the separable parts of the Tray B, which can be placed in the holder so that the fracture may occur at any desired angle relative to the pier tooth. Two sizes. The cut is exact size of No. 1 Tray. The Tray of No. 2 is $\frac{1}{16}$-inch larger in diameter.

Price, No. 1 Small.....$0.40
" " 2 Large..... .40

ADJUSTABLE PARTIAL IMPRESSION TRAY.

Pattern furnished by
Dr. Justus Stolley.



This device conveniently takes the place of three partial impression trays.

The Tray proper rotates on the pivot B, and is thus perfectly adapted for use in the front or either side of the mouth; and is firmly held in either position by the sliding guard A.

Price...each $0.60

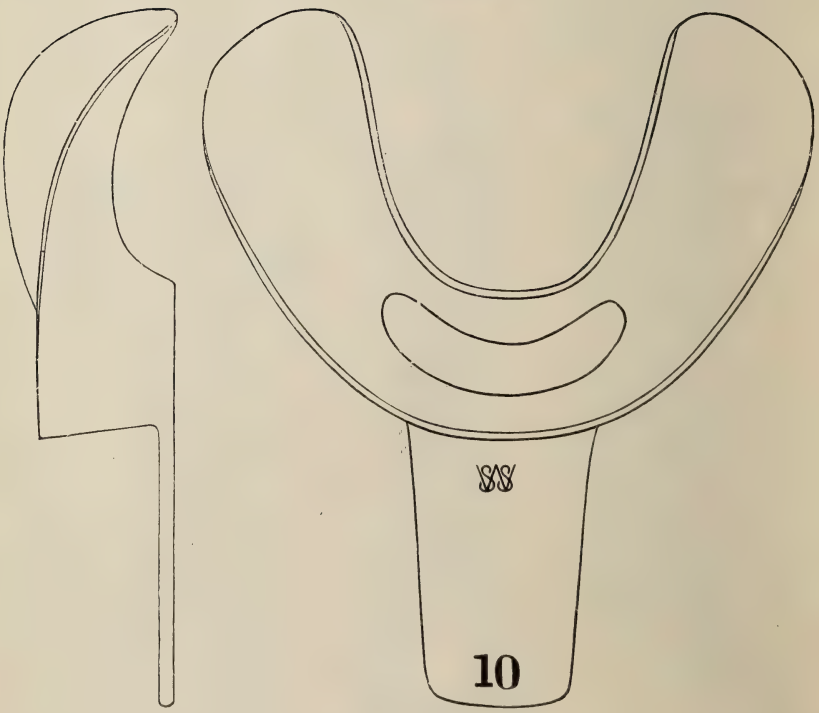
PARTIAL LOWER IMPRESSION TRAYS.

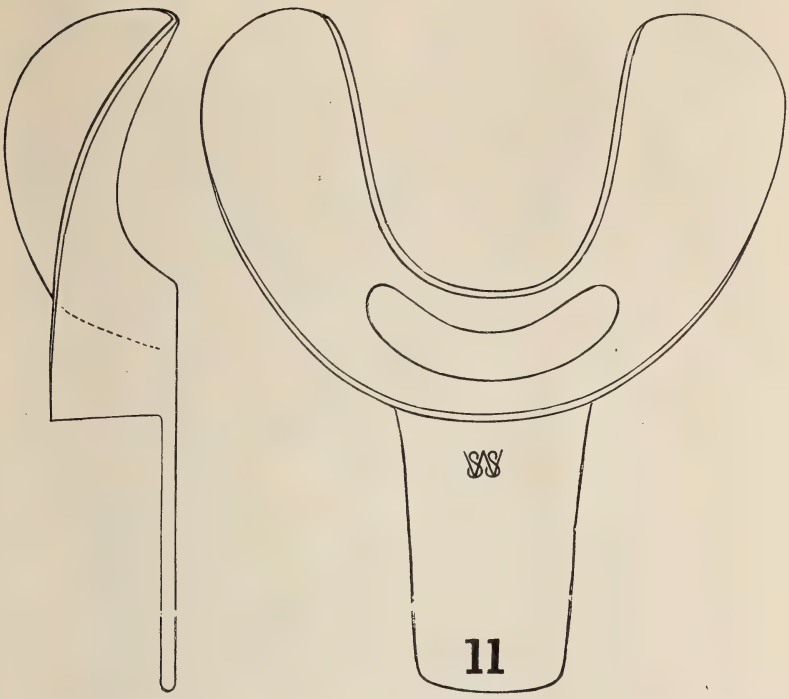
Form G illustrates the shape of a set of four, Nos. 10 to 13, for Partial Lower Dentures, with an opening to allow the front teeth to pass through, and the Tray to pass down to the maxillary ridge. The handle is 1½ inches in length, and attached to the base of the Tray at its highest point.

The exact size of each Tray of the set is outlined, with its number, by which it may be ordered. The side views show the relative dip of the outer and inner edges of the Tray.

Price, Lower Trays, Nos. 10 to 13.....each $0.25

FORM G.

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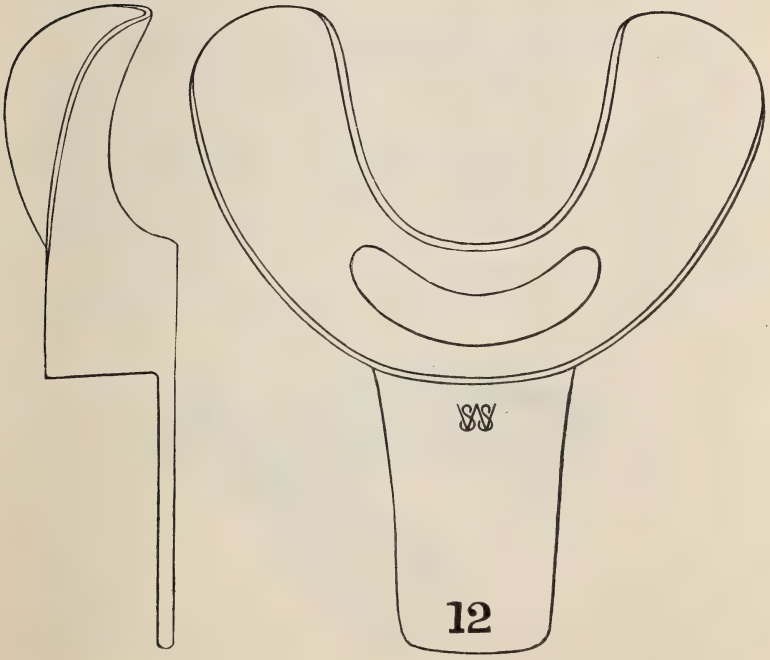
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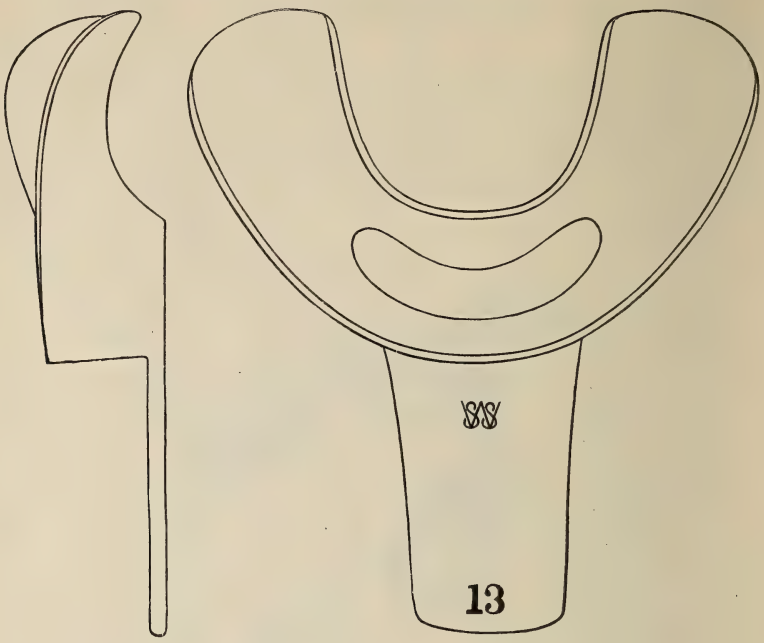


LOWER IMPRESSION TRAYS.

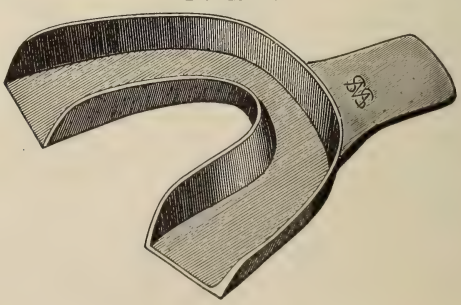
With Flat Bottom and Square Sides.

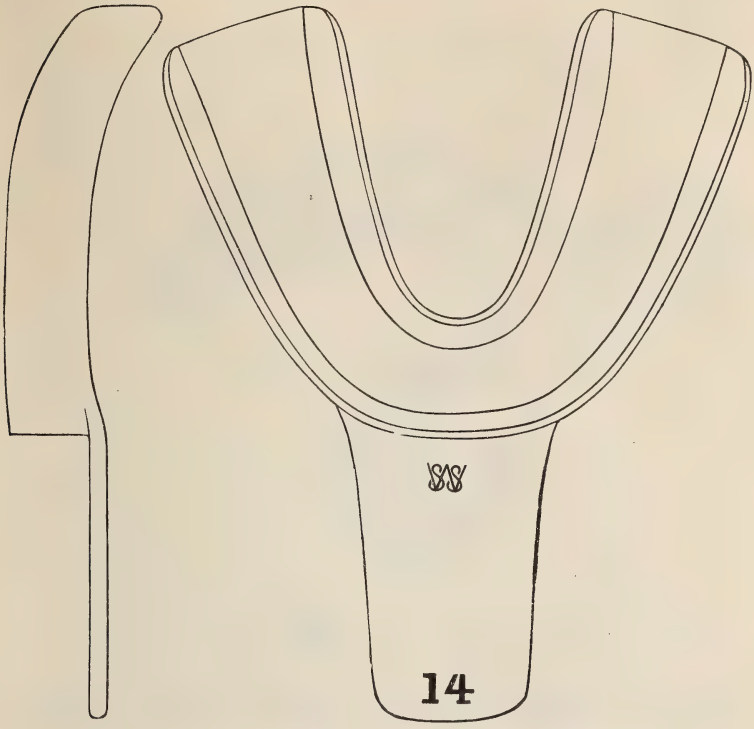
Form H illustrates the shape of a set of three, Nos. 14 to 16, with flat bottom and square sides, designed especially, in taking impressions of Lower Teeth, to obtain the antagonizing model for the Upper Dentures.

The exact size of each Tray of the set is outlined, with its number, by which it may be ordered. The side views show the position of the handle, and the height of the body of the Tray.

Price, Lower Trays, Nos. 14 to 16 (Flat Bottom).....each $0.25

FORM H.

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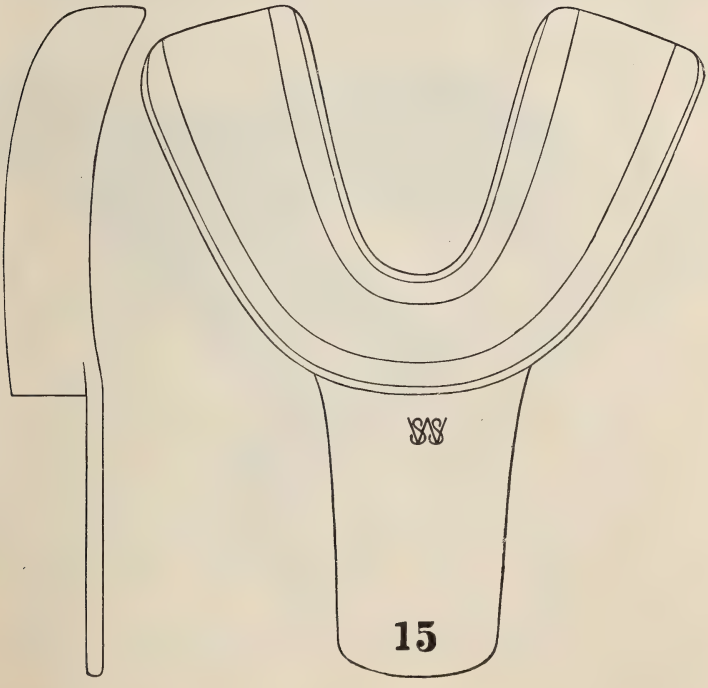
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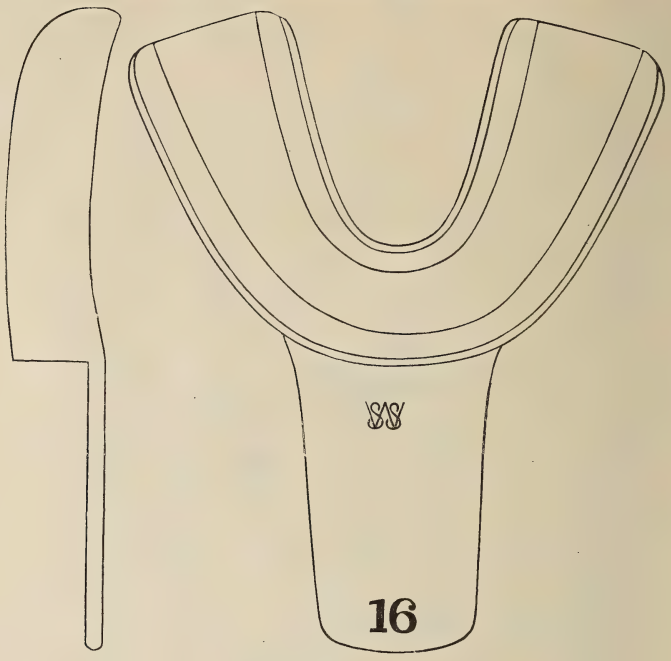
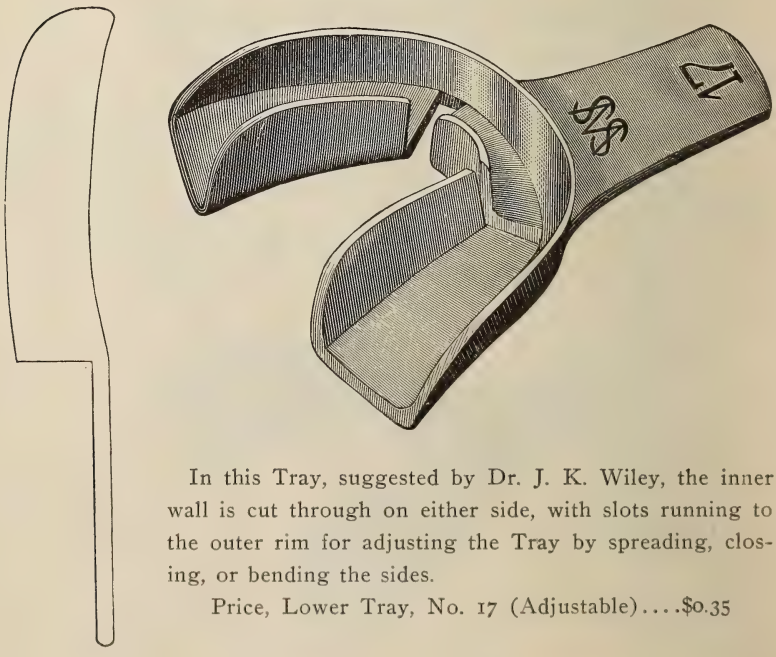


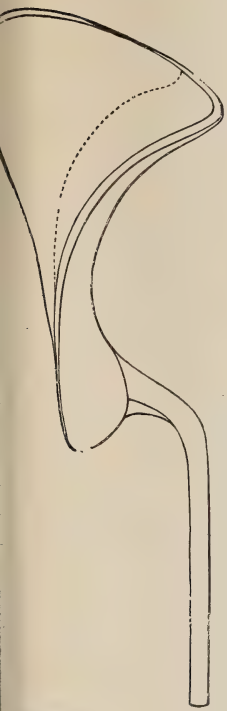
ADJUSTABLE LOWER IMPRESSION TRAY.

Patented August 24, 1886.



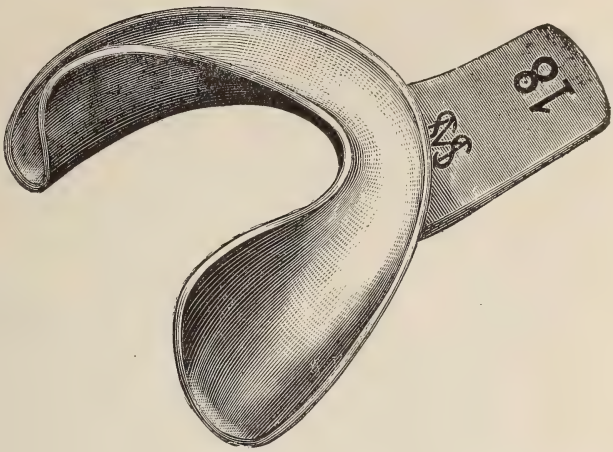
In this Tray, suggested by Dr. J. K. Wiley, the inner wall is cut through on either side, with slots running to the outer rim for adjusting the Tray by spreading, closing, or bending the sides.

Price, Lower Tray, No. 17 (Adjustable)....$0.35

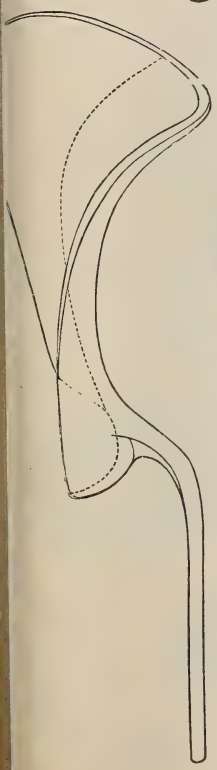


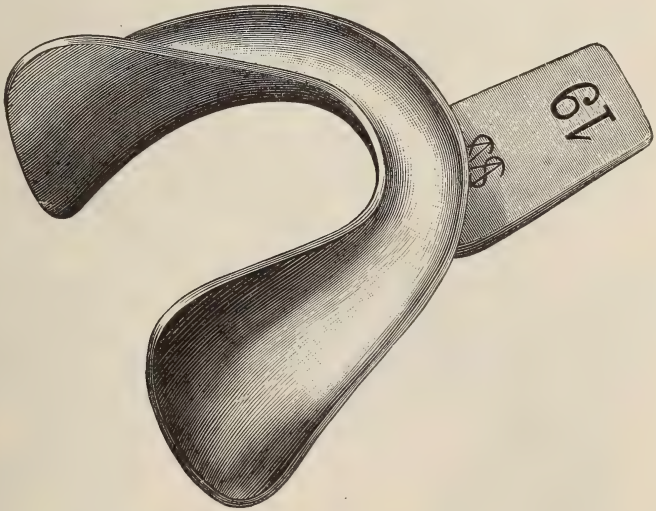
Adjustable Lower Impression Trays.

Suggested by Prof. Henry I. Dorr.



The distinguishing features of these Lower Impression Trays are the posterior lingual wings, which enable the operator to obtain an accurate impression of the jaw on either side of the tongue. These wings may easily be spread apart, or brought toward each other, or twisted, or cut away to adapt the Tray to nearly any size or shape of the edentulous lower jaw.

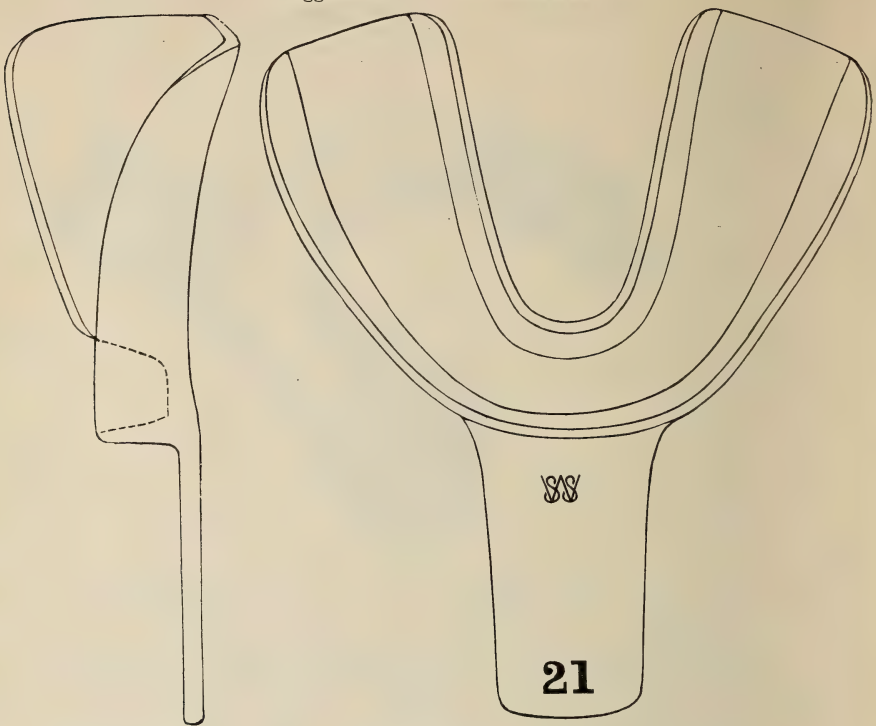


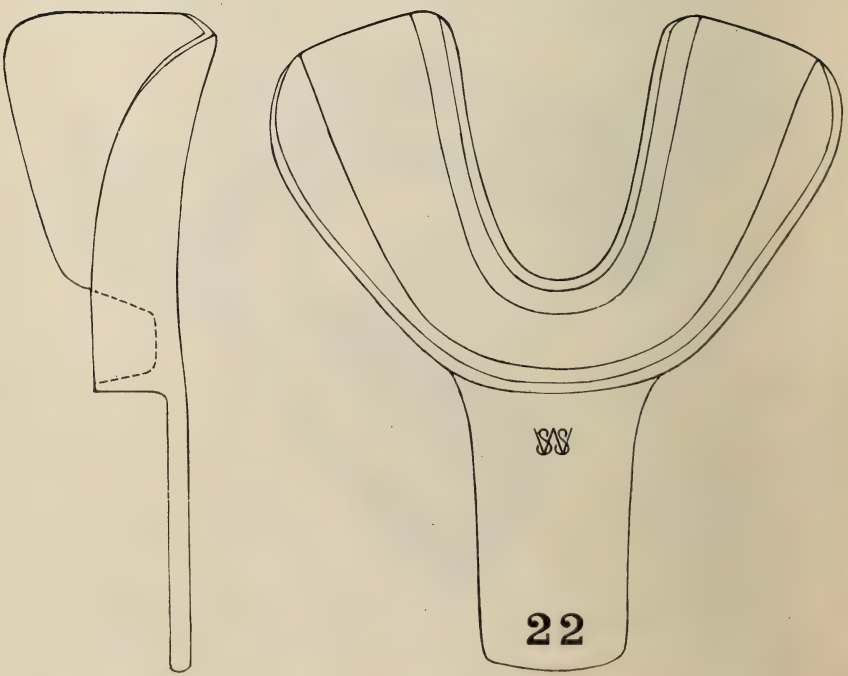


Price, Lower Trays, Nos. 18, 19 (Adjustable)..each $0.35

Deep Lower Impression Trays for Regulating.

Suggestion of Dr. P. F. Struppler.





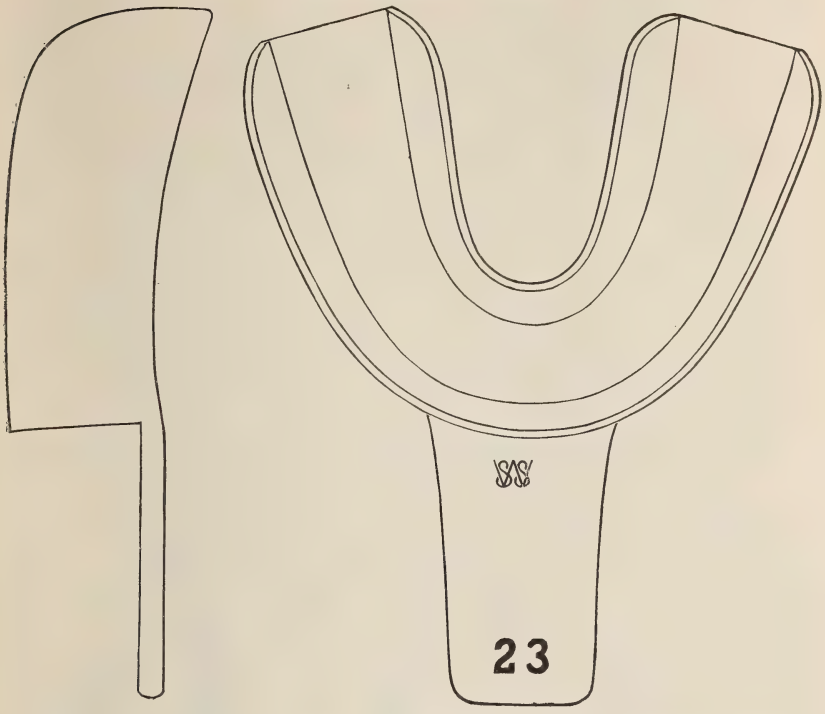
Nos. 21 and 22 are for cases where specially deep Trays are required. The lingual extensions are adapted to secure accurate impressions when the lower molars are missing.

Price, Lower Trays, Nos. 21, 22.....each $0.35

LOWER IMPRESSION TRAY No. 23.

For Partial Cases

Suggested by Dr. H. B. Noble.



The object of this Impression Tray is to supply a ready means of taking impressions of the entire lower crowns and gum in cases where only a few teeth are missing. For this reason the walls, both outside and inside, are made high and strong, and run out almost flush with the ends.

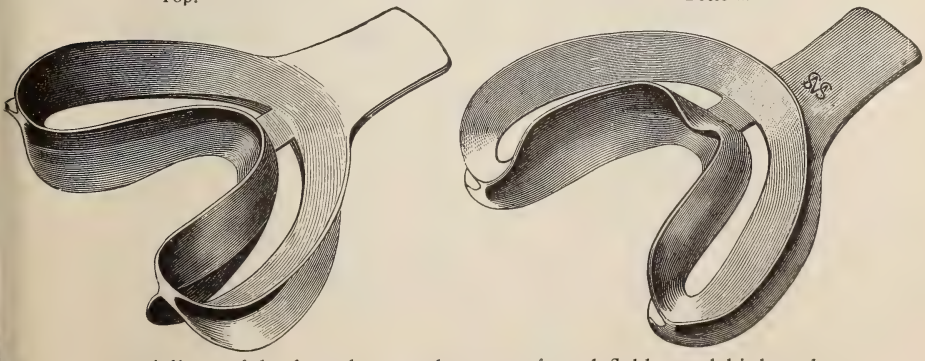
Price, Lower Tray No. 23.....$0.35

FRANKLIN'S LOWER IMPRESSION TRAYS.

Form I illustrates Dr. B. W. Franklin's Impression Tray, of which there are three sizes for taking impressions in plaster for lower dentures. They

Form I.

Top. Bottom.



are specially useful when the muscles are soft and flabby and higher than the maxillary ridge. They are readily extended or contracted by bending.

Price, Lower Trays, Franklin's.....each $0.50

FRANKLIN'S LOWER IMPRESSION TRAYS.

Following is Dr. Franklin's description of the use of his Tray:

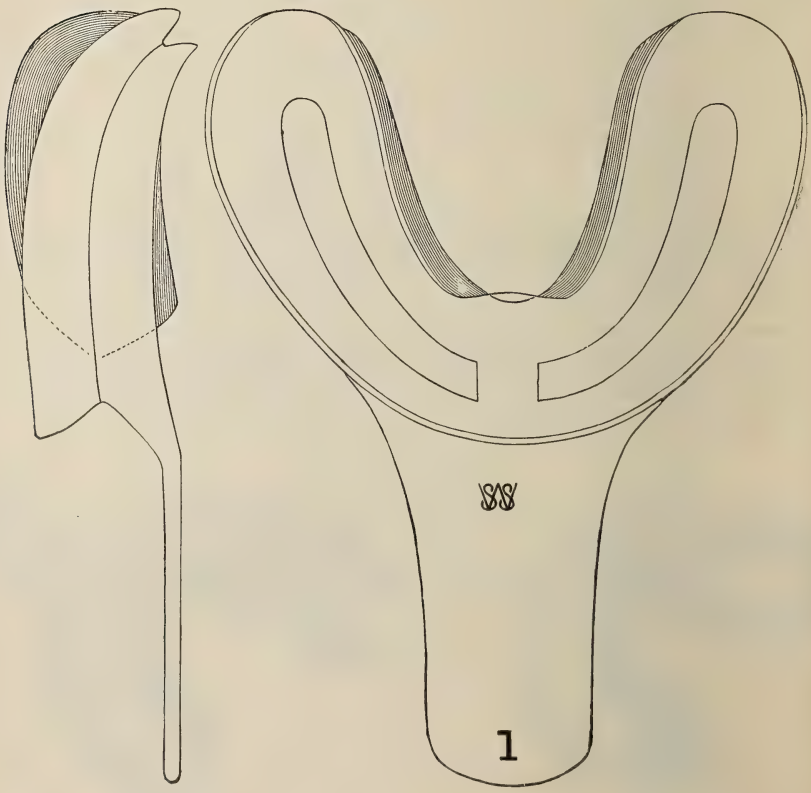
"This cup, or rather double cup, has a groove or space in its center all the way round. The advantages of this groove are, that when the lower part of the cup is filled, and the upper part one-fourth full of plaster, and placed in position over the ridge, the operator, with the end of the finger or other suitable means, can gently agitate the whole mass of plaster in the cup, and thus prevent air-bubbles, blanks, or other imperfections on the surface of the impression. The peculiar shape of the outer flanges of this cup is such as to distend the cheeks, while the lower inner edges, pressing upon the submaxillary and sublingual glands, depress them sufficiently to prevent any folds or ligamentous attachments from being embraced by the impression."

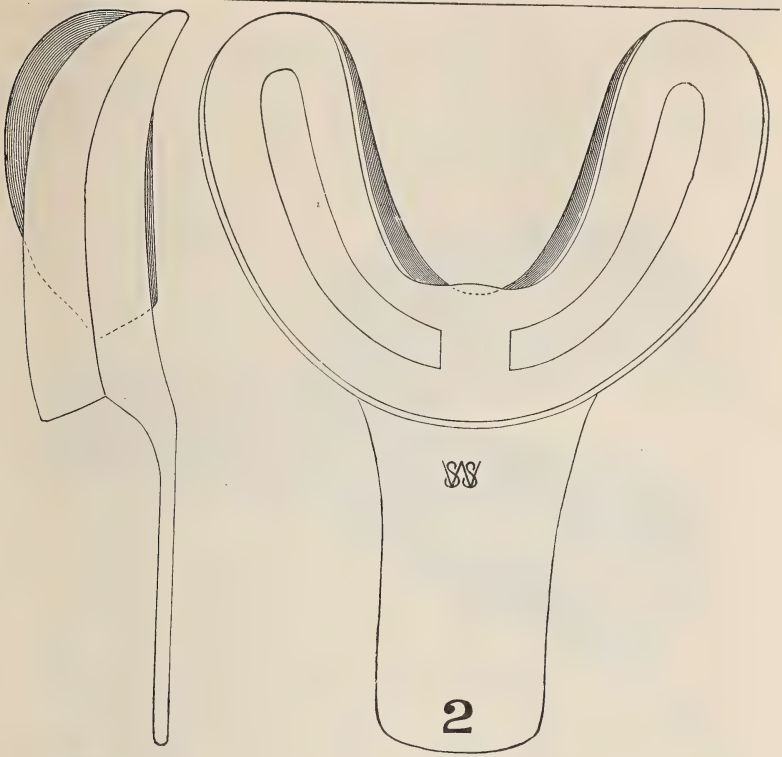
SAMUEL S. WHITE. Dear Sir:—I have examined the Trays made by you, known as "Franklin's Improved Impression Trays," and highly approve them. They meet my ideas better than any I have heretofore seen.

The handle is of proper length and in right position, clearing the lip and allowing the Tray to sit down on the maxillary ridge. The edges of the Trays are so thin that they can be shaped to the maxillary by a pair of pliers, and may thus be readily adapted to different conformations.

The three sizes you manufacture seem to me to meet all the requirements.

Very truly, etc., B. W. FRANKLIN.

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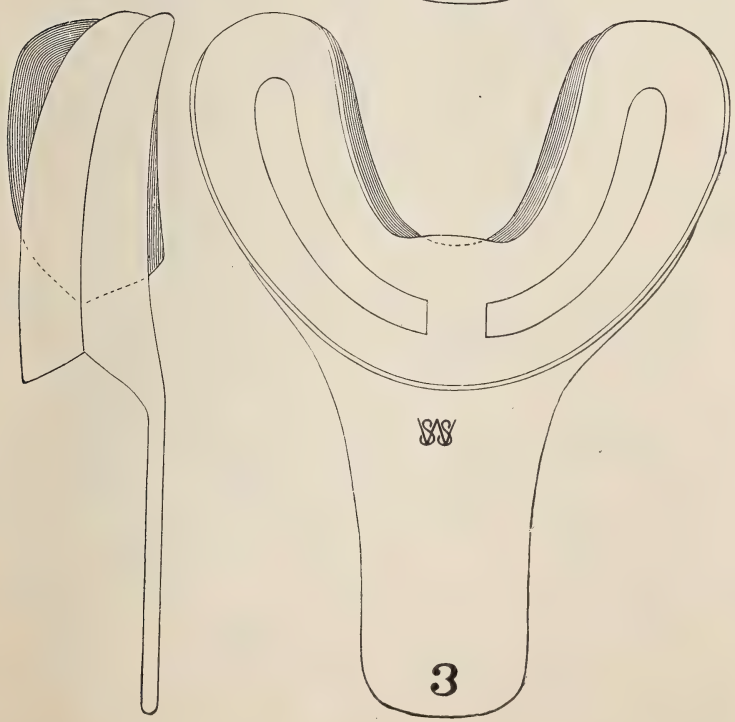
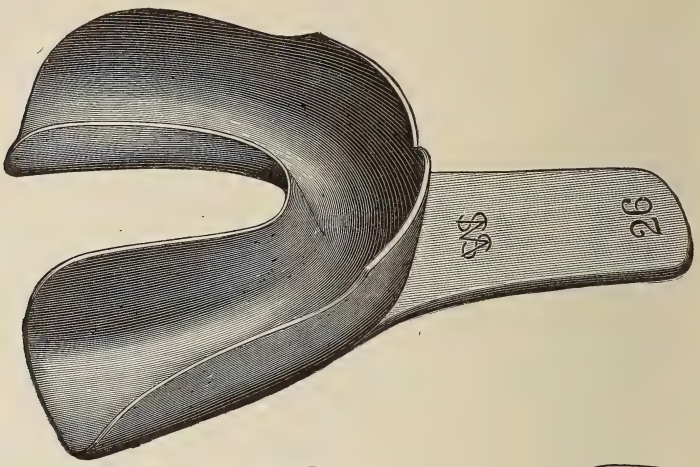

3

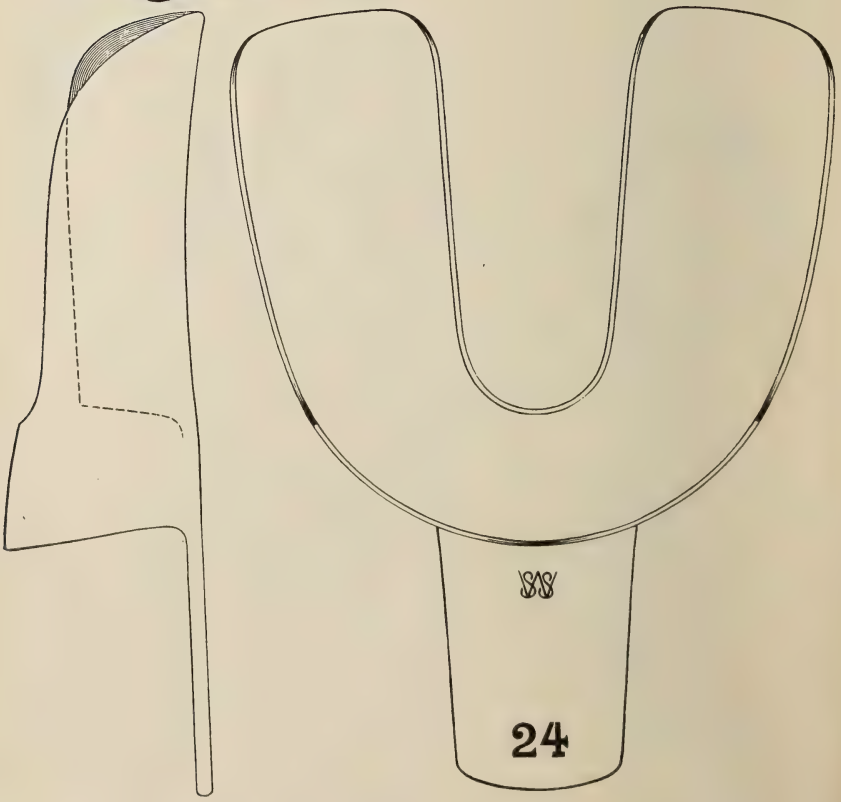
ANGLE'S LOWER IMPRESSION TRAYS.

These Impression Trays are designed especially for use in obtaining impressions in cases of irregularities. The Trays are of such shape and height that it is only necessary to evenly fill them with plaster, leaving but very little surplus material to cause annoyance.

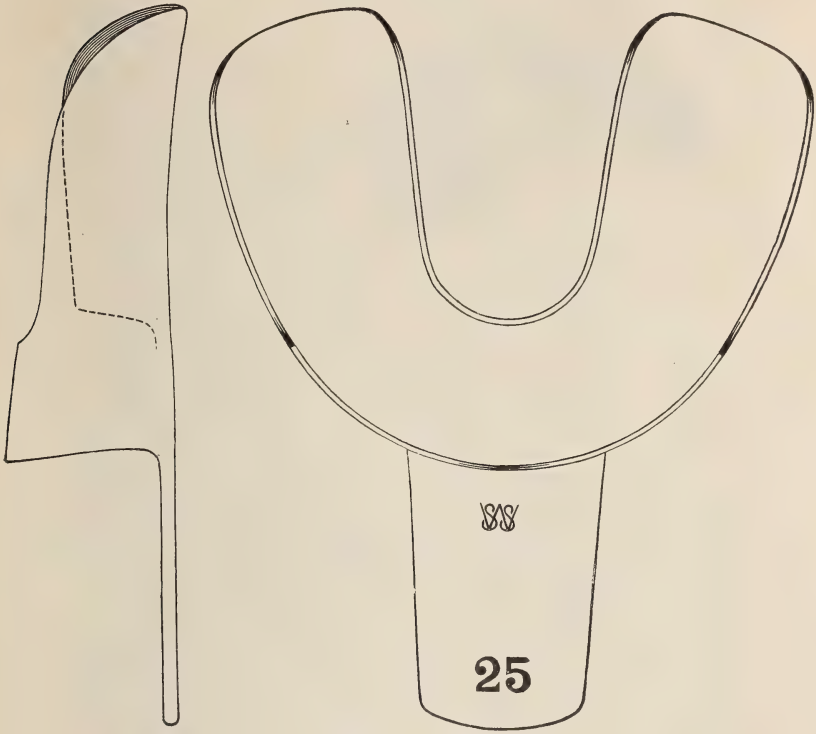
Price, Angle's Lower Impression Trays.....each $0.35

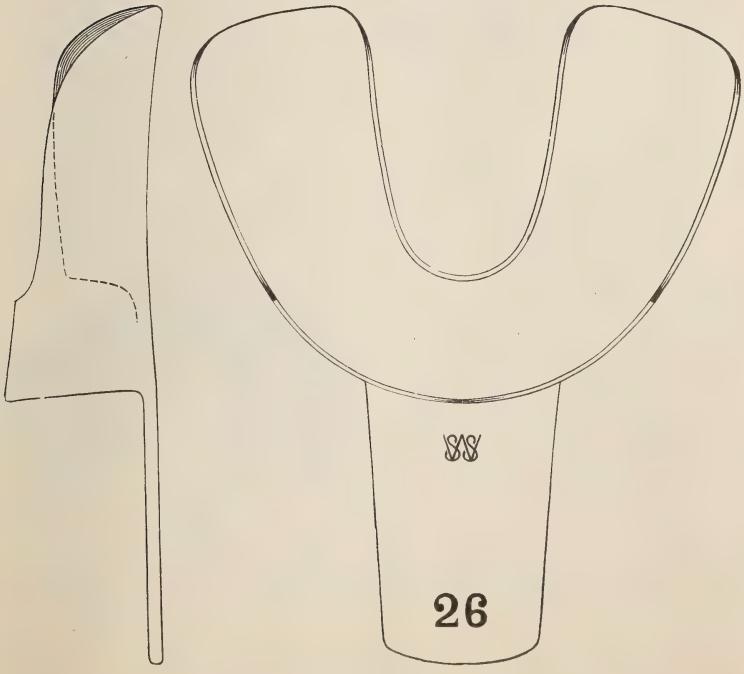
A





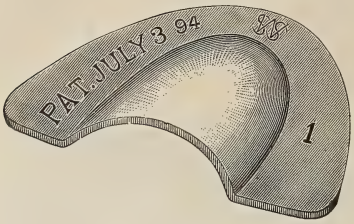
ANGLE'S LOWER IMPRESSION TRAYS.

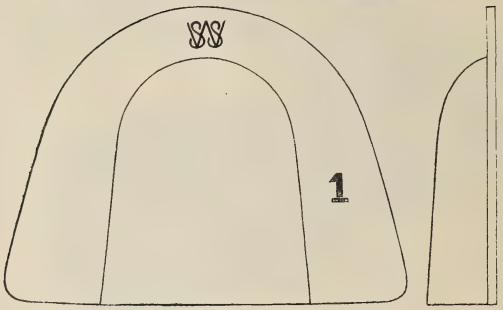


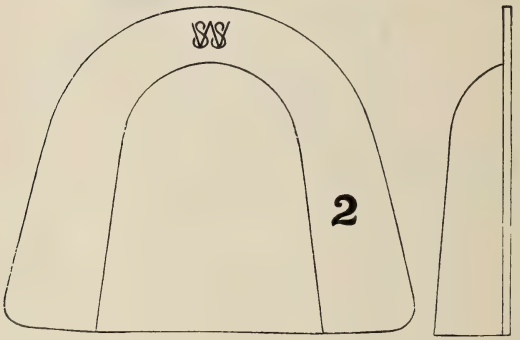


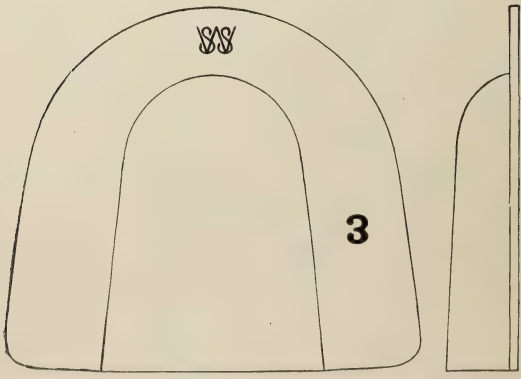
TRUE BITE PLATES.

Patented July 3, 1894.









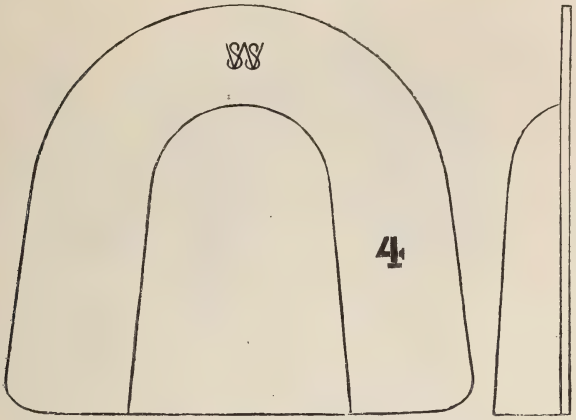
A true bite and an accurate impression are prime factors in the process of making a successful complete or partial denture. To save time, get an exact tooth-length gauge and a correct articulation, the bite should be taken at the first sitting. This can now be readily done by the use of the True Bite Plates, which we supply in eleven sizes: The Uppers are Nos. 1, 2, 3, 4, 5,—the cut, Fig. 1, shows the smallest size. The Lowers are Nos. 6, 7, 8, 9,—the cut, Fig. 6, shows the smallest size. The combined Upper and Lower Duplex are shown in Nos. 10 and 11. Nos. 12, 13, 14, and 15 are Partial Bite Plates.

The soft yet sufficiently stiff and thin metal of the Bite Plates may be sheared for change of edge contour, bent for adaptation, or cut with Plate Nippers for partial cases.

For taking the Bite, see Dr. W. S. How's Method, page 39.

TRUE BITE PLATES.

Patented July 3, 1894.



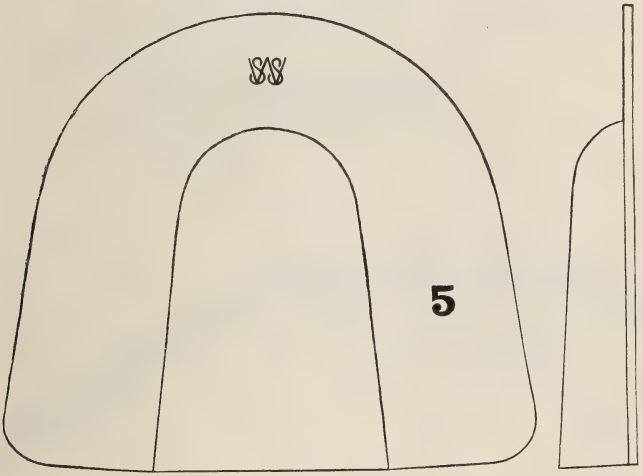
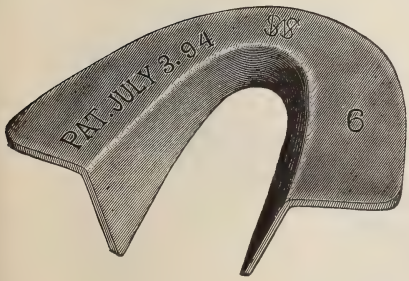
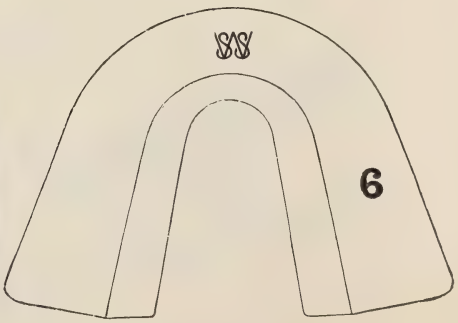


Fig. 6.

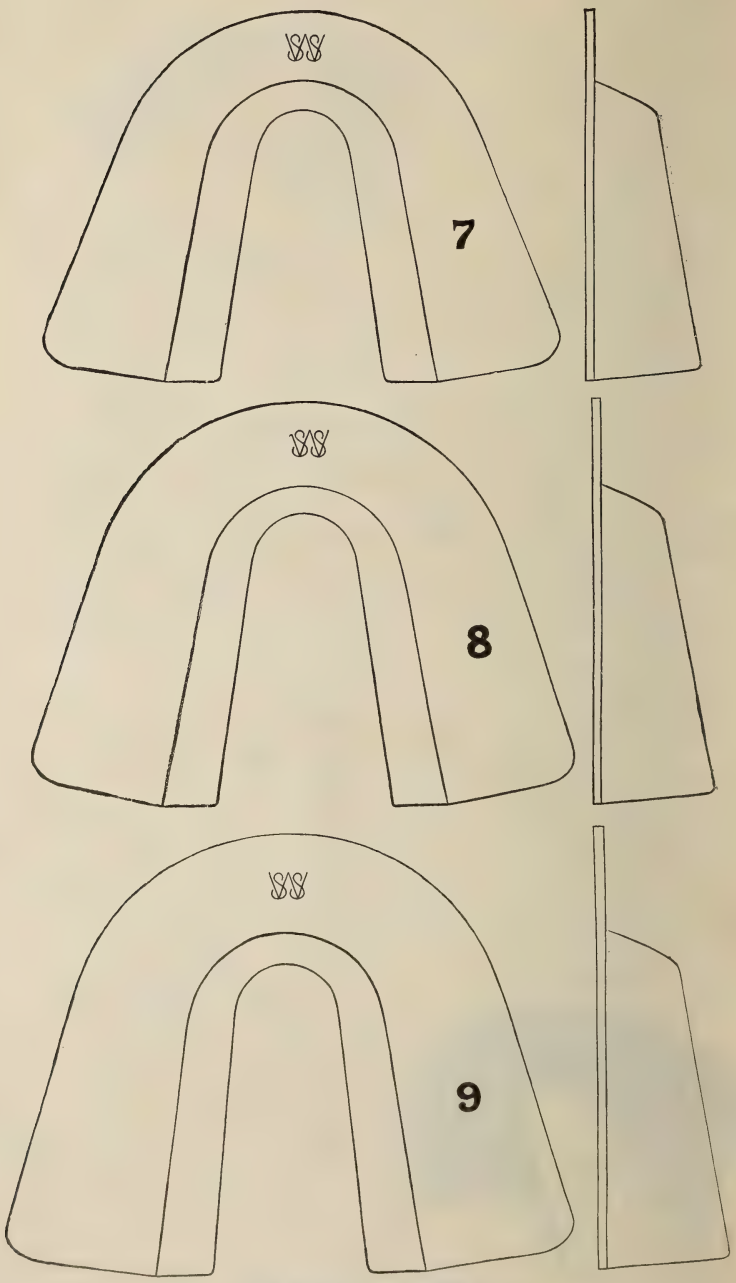




For Prices see page 90.

TRUE BITE PLATES.

Patented July 3, 1894.

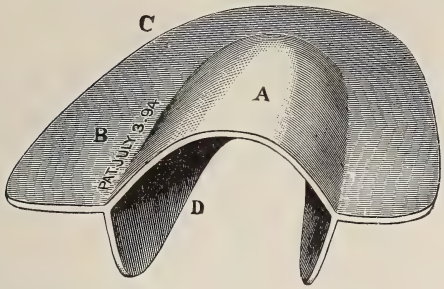


For Prices see page 90.

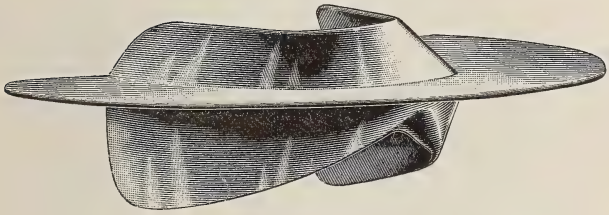
TRUE BITE PLATES.

Patented July 3, 1894.

No. 10.



No. 11.



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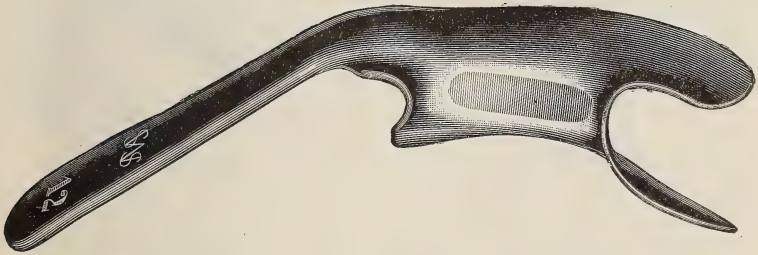
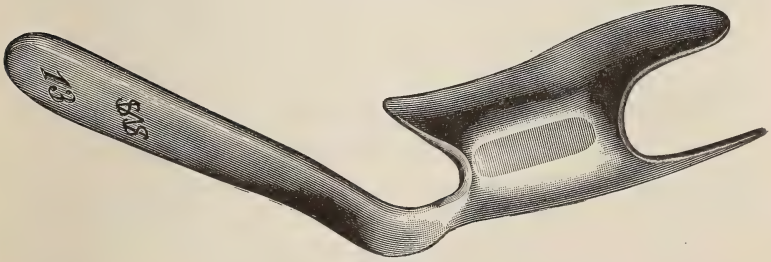


No. 13.



For Prices see page 90.

TRUE BITE PLATES.

No. 14.

No. 15.

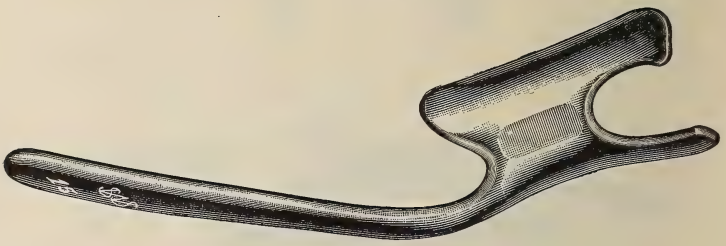


Fig. C.

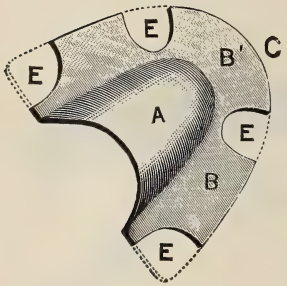
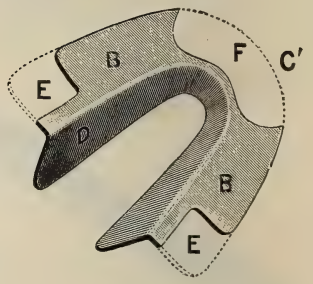


Fig. D.



Figures C and D show how with the plate-nippers the dentist can convert an upper or lower Bite Plate into a partial one to suit the case in hand.

PRICES.

True Bite Plates,	Upper, Nos. 1 to 5	each	$0.20
" " "	Lower, Nos. 6 to 9	"	.20
" " "	Upper and Lower Duplex Nos. 10 and 11	"	.35
" " "	Partial, Nos. 12, 13, 14, 15	"	.35
" " "	Trial Set of Four, Nos. 2, 3, 7, and 8.	per set	.75
" " "	Complete Set, Nos. 1 to 11		2.25
" " "	" " " 1 to 15		3.65

Modelling Composition for Impressions.

Our Modelling Composition is of medium temper,—neither too hard nor too soft,—and adapted to all the ordinary uses of the dentist; softens either in dry heat or hot water,—the latter preferably; sets quickly, say in one and a half minutes.

Dentists who do not find exactly the characteristics they want in either plaster or wax will do well to try the Modelling Composition. When softened it readily takes the contour of surfaces against which it is pressed, forming a clean, sharp impression, and when again set it is remarkably rigid, holding its shape firmly. It has also the decided advantage of almost entire freedom from shrinkage in hardening. Many practitioners prefer Modelling Composition to either wax or plaster, and use it exclusively.

Put up in half-pound enameled metal boxes.

Price.....per lb. $0.75
" .....in 10-lb. lots " .65

Modelling Composition for Base-Plates.

Put up in Enameled Metal Boxes.

The easy manipulation of Modelling Composition and its rigidity early suggested to Dr. W. S. Elliott its use for base or "trial" plates, for which purpose it proved to be particularly well adapted.

We put it up for this purpose in oblong sheets 5¾ x 3 in.

Price, in half-pound boxes.....per box $0.63

DENTISTS' PLASTER.

FOR TAKING IMPRESSIONS AND MAKING CASTS.

Our Dentists' Plaster has two points of superiority: Quality and honest dealing. Its quality needs no exploiting. It is known. With regard to the other point, a word may not be out of place. For a barrel we sell 300 lbs.; for a half-barrel, 150 lbs.; for a quarter-barrel, 75 lbs. The packages are never less, frequently more, and then the buyer gets the advantage. Our cans are packed by machinery, and contain the quantity they are advertised to contain every time; they have the name, etc., stamped in the lid as shown.

In ordering, state whether for casts or impressions. We keep both kinds on hand, and send that for casts unless otherwise ordered.

PRICES.

Two-Quart Can	$0.30	Three-Peck Can	$2.00
Six-Quart Can	.70	Quarter-Barrel	1.60
Twelve-Quart Can	1.15	Half-Barrel	2.50
Half-Bushel Can	1.45	Barrel	3.50

These are the prices at Philadelphia. Freight and expenses added when sold at other depots. Boxing on cans extra.

RUBBER APRON.

Our Rubber Aprons are 43 inches long and 34 inches wide at the middle line,—big enough to afford ample protection to the clothing, not big enough to interfere with freedom of movement. Can be put on and taken off almost instantaneously.

Made of rubber cloth, and nicely finished, with the edges bound.

Price.....each $0.75

RUBBER BOWLS FOR MIXING PLASTER.

These Bowls are made of soft vulcanized rubber thick enough to give all the strength and rigidity required. They cannot be broken; their sides can be pressed together to form a lip for pouring thin-mixed plaster; and any unused plaster which sets in them can be thoroughly crushed and removed by squeezing the sides together.

They are made in our own factory, with our trade-mark and the letter indicating the size stamped on the bottom, as shown.

They are designated as A, B, C,—A smallest, B medium, and C the largest. A is 3¼ inches in diameter at the top by 2¼ inches in depth; B, 4 inches in diameter by 2¾ inches in depth; and C, 4½ inches in diameter by 3½ inches in depth.

PRICES.

Rubber Plaster Bowl,	A	each $0.50
" " "	B	" .60
" " "	C	" .80

PLASTER SPATULAS.

No. 17,	Spatula or Palette Knife,	with	Patent	Bolster,	4-in.				$0.25
" 18,	"	"	"	"	"	"	"	5- "	.30
" 19,	"	"	"	"	"	"	"	6- "	.40
" 19½,	"	"	"	"	Sq. End	"	"	4- "	.30

COATINGS FOR PLASTER CASTS.

Collodion, in 2-oz. bottles, with Brush	per bottle	$0.40
" " 6-oz. "	"	.80
Sandarac Varnish, in 2-oz. bottles	"	.25
Extra Shellac Varnish, in 2-oz. bottles	"	.25
Liquid Silex, in 2-oz. bottles, with Brush	"	.20
Elliott's Parting Fluid	"	.25
Gilbert's Imperial Varnish	"	.25

ARTICULATING PAPER.

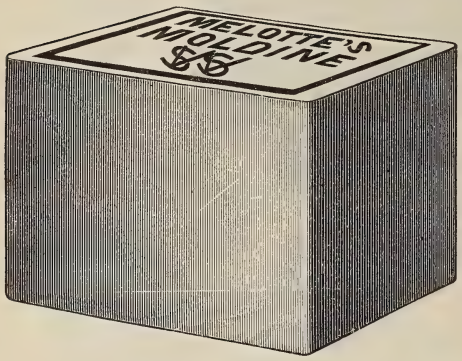
The manufacturer of this well-known English preparation claims that it is entirely free from oil, smell, or taste; is chemically unchangeable, and almost everlasting. No other means so readily and effectually shows defects in the bite or articulation. Put up in books containing one dozen sheets.

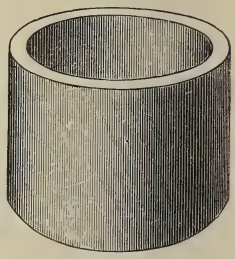
Price, Thick or Thin Sheets.....per book $0.08

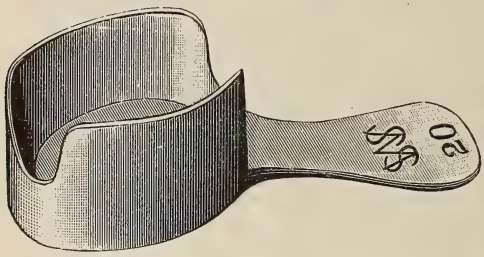
Spatula or Palette Knife.

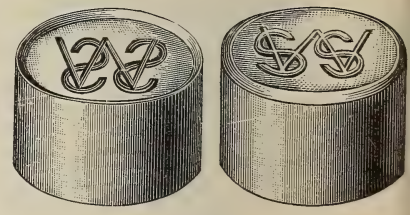
DR. MELOTTE'S MOLDINE,

Impression Cup, Ring, and Fusible Metal, for Crown Dies and Counter-Dies.









Moldine is one of the indispensables in the dental office, especially one in which crown- and bridge-work is a feature. With the Impression Cup, Ring, and Fusible Metal it simplifies and expedites crown- and bridge-work. An impression of one or two teeth and roots may be taken and dies made for fitting gold caps or regulating fixtures in less than five minutes.

Moldine is also an immediate investment for work to be soldered; solder will not flow over the part covered with Moldine. Metal work may be thus made or repaired without waiting for the investment to dry or set. If Moldine stiffens by use, knead in a little glycerin.

Instructions accompany each package.

In ordering Moldine sent by mail please add to the remittance the postage, 20 cents for the complete apparatus; 10 cents for the material alone.

PRICES.

Complete Outfit, inclosed in a tin box containing one-half pound Moldine, one Impression Tray, one Ring, and two ingots of Fusible Metal	$1.25
Melotte's Moldine, per half pound	.40
Impression Cup (S. S. W. No. 20)	.25
Rubber Ring	.05
Fusible Metal, per ingot (about 2½ ounces)	.30

WAXES FOR IMPRESSIONS.

The wax in our Impression and Base-Plate Preparations is genuine old-fashioned beeswax.

When we sell a preparation as "pure wax," we mean pure beeswax, unadulterated with "earth-wax," tallow, or any other cheapening ingredient. What we sell for "gutta-percha and wax" will be found on the application of the proper tests to be gutta-percha and beeswax, and nothing else. So with our paraffin (white or pink) and wax: paraffin and beeswax are there in due proportion, without foreign admixture.

In short, we sell just what the label indicates.

Should we ever find that earth-wax, tallow, etc., have any usefulness to dentists in the taking of impressions or the making of base-plates, we shall have business sagacity enough to put up preparations containing them and courage enough to announce the fact. So far, however, these things are "useful" only to unscrupulous manufacturers, who employ them without regard to their effect on the compounds with which they are incorporated, because they cheapen cost and so increase profits,—a practice about on a par, ethically, with selling "gutta-percha and wax" which has never a trace of gutta-percha.

These Waxes are put up in half-pound boxes.

PRICES.

Yellow Wax, in Enameled Boxes	per box	$0.38
Gutta-percha and Wax	"	.63
Pink Paraffin and Wax	"	.50
White " " "	"	.50
White Wax	"	.60

DAINTY
IMPRESSION
WAX

THE S. S. WHITE DENTAL MFG. CO.

Dainty Wax is first of all an Impression Wax. For taking impressions there is no essential point in which it is not at least equal to any other. It is a working wax, not an ornamental preparation. Try it and you will be convinced of its superiority in the practical points: Thus, it softens quickly in the heat of a small burner by the chair; kneads and pulls like chewing-gum; its surface can be "flown" without damage; it is extra tough, and takes an impression at least equal to any other means. Besides, it is beautiful in appearance; milk-white in color; cleanly to work; does not stick to the hands. To these elegancies, which rather enhance its practical value, it owes its name.

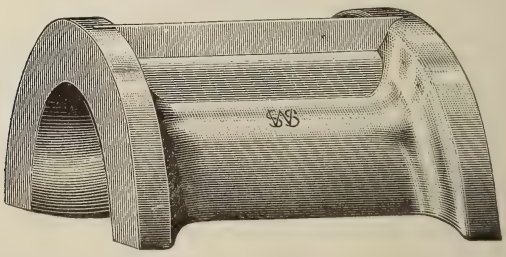
Dainty Wax is also excellent for taking bites, its characteristic toughness preventing the thin film between grinding-surfaces from being torn and displaced as is so frequently the case with other substances.

Put up in half-pound boxes.

Price.....per box $0.60

WAX KNIFE CLEANER.

Suggested by Dr. B. F. Cosbey.



The wax which accumulates on a knife is readily removed with this Cleaner, which consists of a half-cylinder of lead, with a thin steel blade cast in its crown. The heads can also be used advantageously as a soft anvil in riveting metal backs on teeth for plate-work, etc., the curve of the edge making it very convenient for such use.

Price..... $0.50

EXTRA TOUGH PINK PARAFFIN AND WAX.

The extreme toughness of this preparation makes it especially desirable for base or trial plates. It can be carved nicely with a sharp instrument. In making an investment for a vulcanite denture, when you get ready to remove the wax trial plate, if you use Extra Tough Pink Paraffin and Wax, you can remove it, when properly softened with hot water, almost entire. Its toughness holds it together so that it comes away in one piece; does not run or dissolve and find its way into the pl ster to soften it.

Put up in half-pound boxes, containing sheets 5¾ x 3 inches.

Price.....per box $0.50

EXTRA TOUGH PINK PARAFFIN AND WAX.

IN STICK FORM.

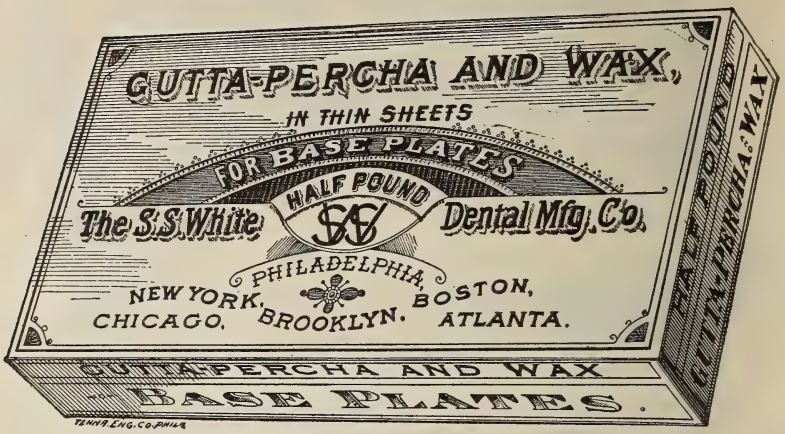
PUT UP IN ENAMELED METAL BOXES.

Extra Tough Pink Paraffin and Wax in sticks is exactly the same in quality as that in sheets for base plates. The form makes it convenient for waxing up cases, for which purpose its toughness admirably fits it.

Price, in half-pound boxes.....per box $0.50

WAXES FOR BASE-PLATES.

Put up in Enameled Metal Boxes.



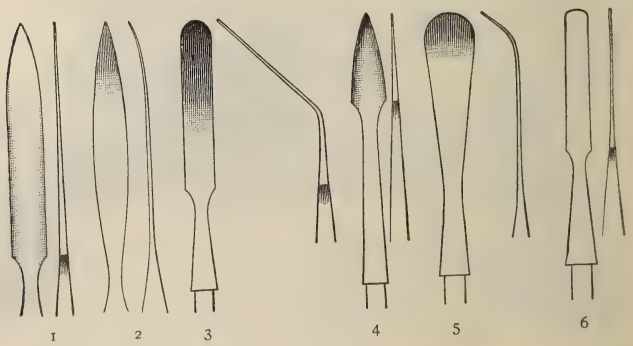
PRICES.

Yellow Wax	per box	$0.50
Gutta-Percha and Wax	"	.63

Yellow Base-Plate Wax is put up in half-pound boxes containing sheets either 3¾ x 3⅛ or 5¾ x 3 inches. When ordering, please state which is preferred. Other Base-Plate Waxes are put up only in the oblong shape, 5¾ x 3 inches.

We would call special attention to our Gutta-Percha and Wax, which contains twenty per cent. of Gutta-Percha. All other makes, so far as brought to our notice, are merely colored to give the appearance of a Gutta-Percha compound.

SPATULAS FOR SOCKET HANDLES.



Price.....each $0.25

TENAX WAX.

The principal virtue of Tenax Wax is its extreme toughness. That is what makes it so useful for trial-plates. It can be shaped over the cast quickly; it takes a sharp contour of the surfaces it is applied to, and holds it. Useful also, therefore, to take bites. Within the range of 65° to 90° F., it holds its shape practically unchanged.

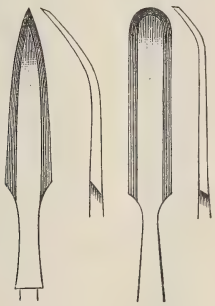
Tenax is pink in color; has a delightful perfume. Made in thin sheets, 5½ x 3 inches, tissue paper between the sheets, so that they can be easily separated. Put up in half-pound enameled tin boxes.

Price.....per box $0.50

GUTTA-PERCHA FOR BASE-PLATES.

Per lb.....$2.25
White Gutta-Percha.....per lb. 2.25

WAX KNIVES FOR SOCKET HANDLES.



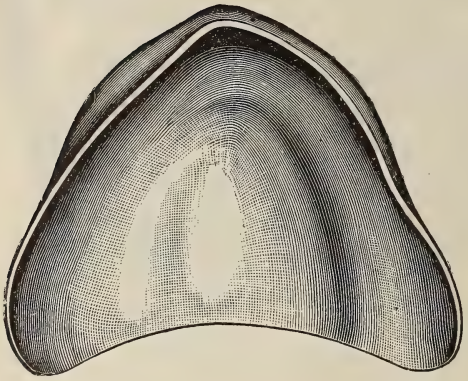
1 2

PRICE.

Each $0.25

The Ideal Dental Base-Plate.

Patented May 8, 1888.



Plastic as Wax.
Rigid as Metal.
Fits like a Glove.
Does not "Crawl" from the Cast, nor Soften under the Heat of the Mouth.

The Ideal Dental Base-Plate is a fixed compound of a brownish color, which is supplied in thin sheets, about 3¼ x 2½ inches. It is hard and, though not easily broken, is somewhat brittle. Held in boiling water, or over a spirit lamp for a few minutes, it softens, and can then be molded easily and rapidly to fit the most minute inequality of the cast as closely as a vulcanized rubber plate. It hardens in a few minutes and is then only inferior in stiffness to a metal plate of the same thickness, and retains its shape as unchangeably. When softened it can be cut with shears; when hard it can be trimmed to any form with a file, even to a feather edge. For trial-plates for taking the bite it is unequaled. It has been—not merely can be, but *has been*—used to mount teeth for actual service in the mouth for a week or so. It does not change its form in the heat of the mouth, but retains its position like a metal plate, neither softening nor pressing out of shape. If broken it is easily repaired, and when repaired is as strong as ever.

Put up in boxes containing 12 sheets.

Price.....per box $0.50

LABORATORY AND OFFICE KNIVES.

Nos. 1 and 2. For trimming plaster casts and rough work in laboratory.

Price.....each $0.15

Nos. 3 and 4 are specially adapted for trimming around the teeth in waxing up and after vulcanizing.

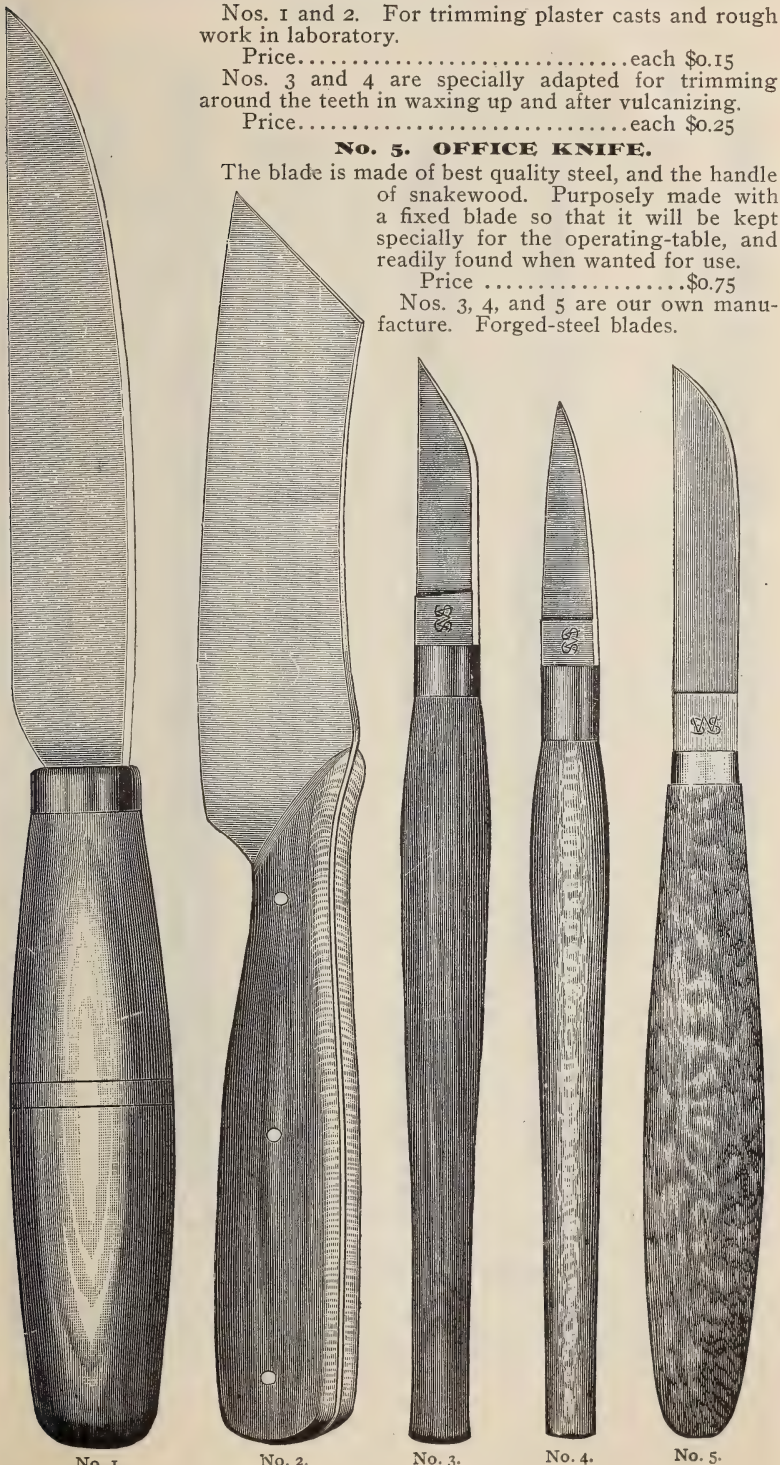
Price.....each $0.25

No. 5. OFFICE KNIFE.

The blade is made of best quality steel, and the handle of snakewood. Purposely made with a fixed blade so that it will be kept specially for the operating-table, and readily found when wanted for use.

Price $0.75

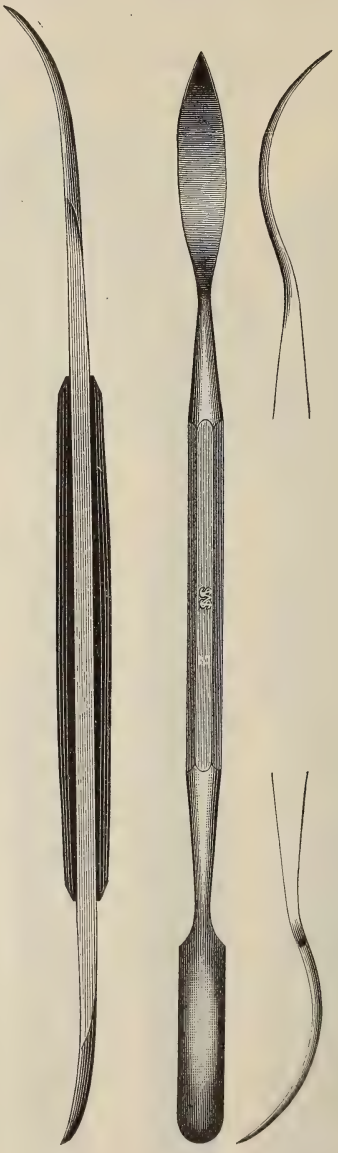
Nos. 3, 4, and 5 are our own manufacture. Forged-steel blades.



No. 1. No. 2. No. 3. No. 4. No. 5.

SPATULAS.

No. 1.



No. 2.

No. 3.

No. 4.

WAX SPATULAS.

No. 1,	Ebony Handle	each	$0.75
" 2,	Octagon Steel Handle	"	.40
" 3,	File-cut Steel Handle	"	.40
" 4,	Fahnestock's	"	.60

SPATULAS.

No. 5.

No. 6.

No. 7.

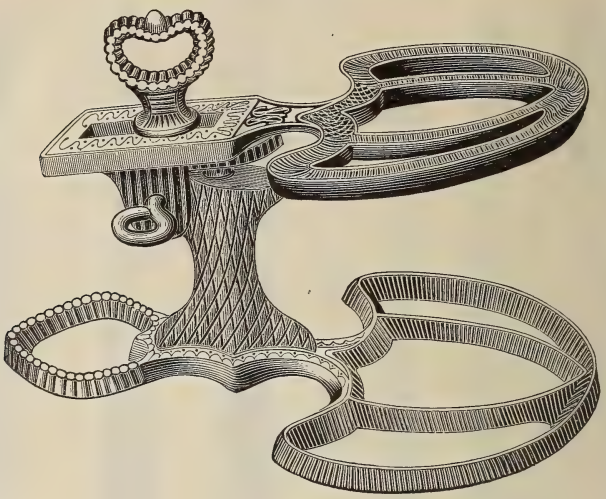
No. 23.

No. 28.

WAX SPATULAS.

No. 5,	Spoon-shaped, Steel.....	each $0.25
" 6,	Round, Bright "	" .20
" 7,	Beale's Pattern "	" .50
" 23,	Designed by Dr. W. H. Dorrance	" .50
" 28,	" " " H. H. Burchard	" .75

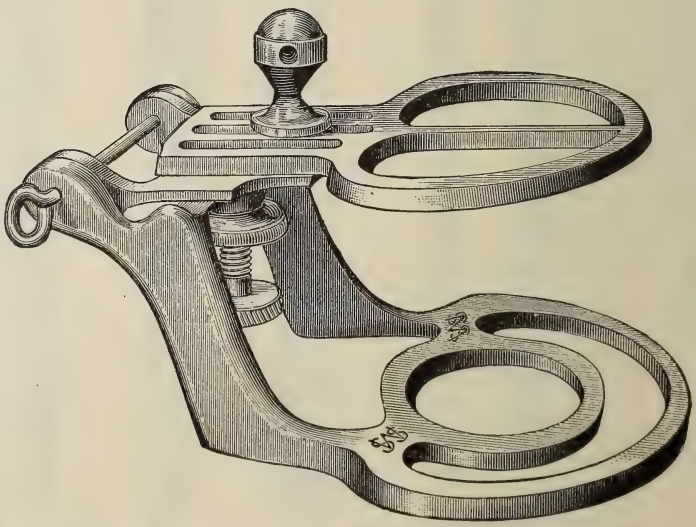
ARTICULATOR No. 1.



Made of brass, lacquered, having a screw and hinge whereby it can be adjusted to any desired angle. The top plate has a backward and forward adjustment, and is held where desired by a set-screw.

Price..... $1.00

ARTICULATOR No. 2.

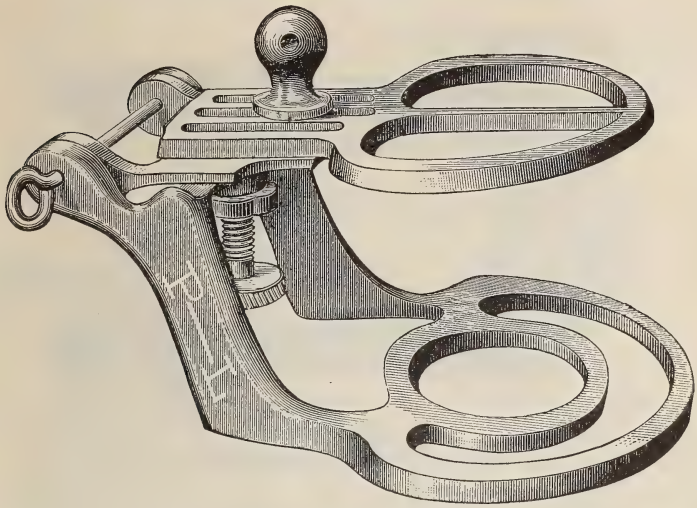


Made of brass. More substantial and better finished than No. 1. It has the same movements, with the advantage that the top plate can be thrown all the way back, and that the set-screw for raising the top plate is more conveniently arranged. This Articulator is nicely finished in all its parts.

Price, Polished and Lacquered..... $2.00

" Nickel-plated 2.50

PLAIN-LINE ARTICULATOR No. 3.

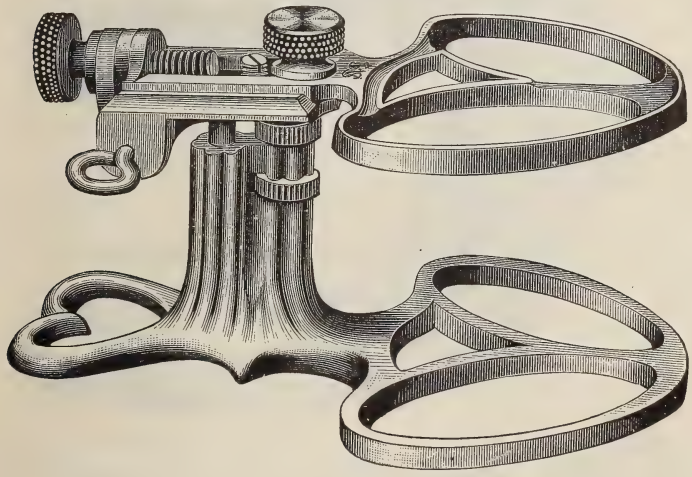


Of the same general design as No. 2, but not so finely finished. Nickel-dipped. It is made to meet a demand for a low-priced article, and is fully equal, if not superior, to any offered elsewhere.

It is designated "Plain-Line."

Price..... $0.90

ARTICULATOR No. 4.

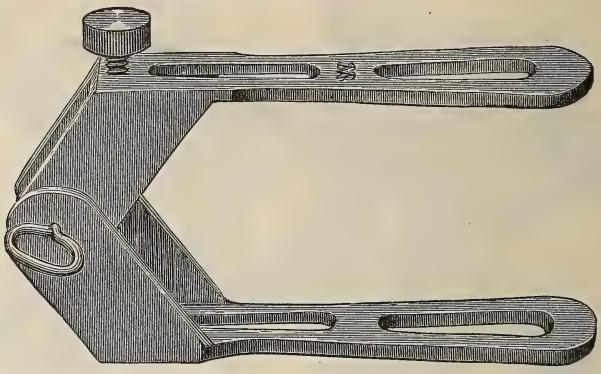


The upper plate has a horizontal adjustment of three-eighths of an inch, and a vertical range of one inch. It has also a pivotal motion, and may be set at any angle or position.

Price..... $2.50

CROWN ARTICULATOR No. 5.

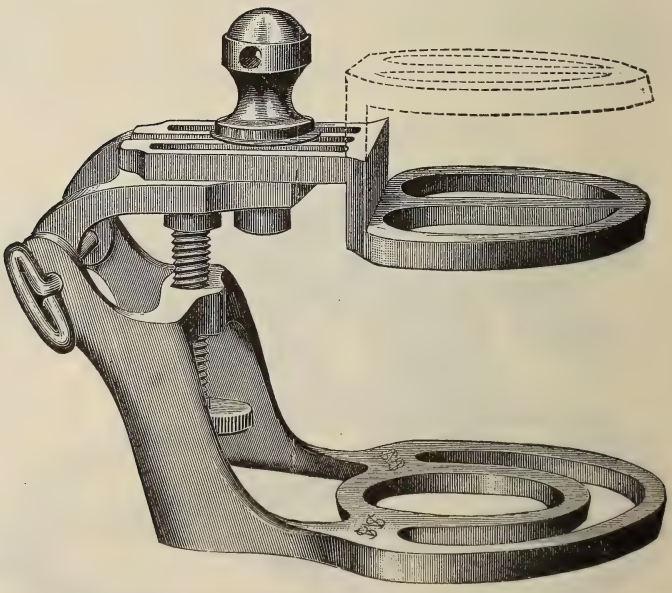
Suggested by Dr. P. G. C. Hunt.



This Articulator, improved by the addition of the graduating screw, is particularly well adapted to the adjustment of small or partial dentures, as it affords a view of the palatal as well as the buccal faces of the teeth.

Price, Brass, Nickel-dipped.....$0.25

ARTICULATOR No. 6.

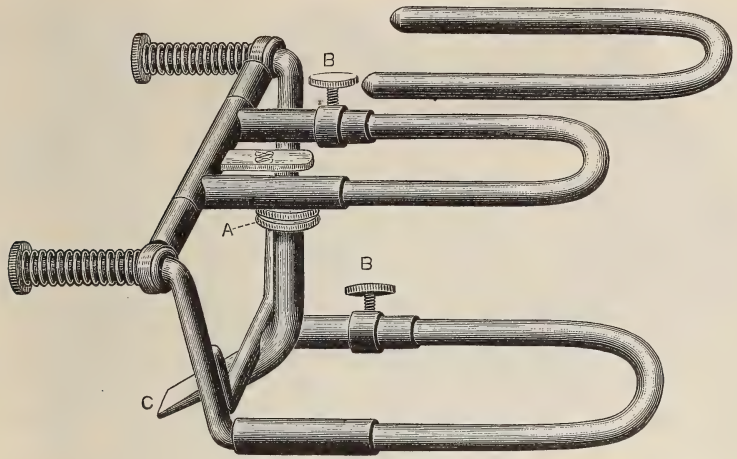


This Articulator is a modification of our No. 2, having all its movements. The upper plate has a double bend, so that when reversed, as shown by the dotted lines in cut, the space between the plates is increased one inch, giving ample room for extra length of bite in upper and lower dentures.

Price, Polished and Lacquered..... $2.00

" Nickel-plated 2.50

ARTICULATOR No. 7.



This Articulator, bearing the designation "Anatomical," is a modification of the original pattern invented by Dr. Bonwill.

The improvement consists in the provision of a standard and stop for fixing, and for raising or lowering the bite by means of the milled nuts shown at A. The standard has a rearward extension indicated at C, to prevent a backward tilt when the Articulator rests upon the table or bench. The thumb-screws B, B secure the bows when seated in their sockets, or at any range of extension. Supplemental bows, as D, are supplied to allow the plaster models to be removed while other models are fixed in the Articulator, care being taken always to seat the bows in their sockets, or to mark on the bows *before removal,* lines indicating exactly the fixed depth of the insertion in the sockets. The lower bows being wider than the upper ones, the natural relations of the models will be reproduced whenever the bows are reassembled and fixed in the sockets as indicated by the bow-ends, or the proper bow marks. The narrow bow holds the upper model, which should be set parallel with the plane of the bow.

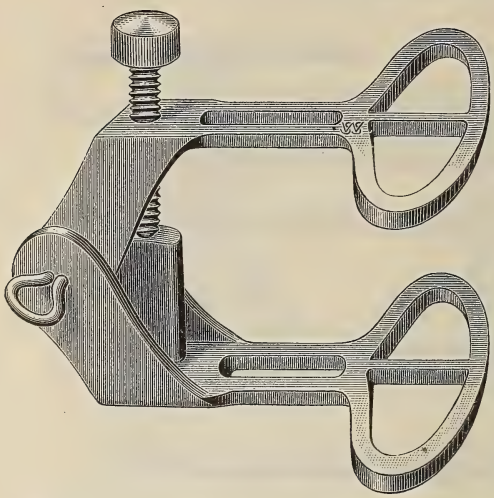
This device, having interchangeable bows, permits the removal of both bows carrying the bite, which may be sent to the Dental Depot to be there replaced in bow sockets for teeth selection and return without occasion for sending the bulky socket-frame. This will thus be usable for other articulations during the transit of the previous bite-bows.

For detailed descriptions of the mode of using this Articulator, see pages 368 to 385, "American Text-Book of Prosthetic Dentistry," edited by Chas. J. Essig, M.D., D.D.S.

PRICE.

Complete with 4 upper and 4 lower Bows.....$2.00

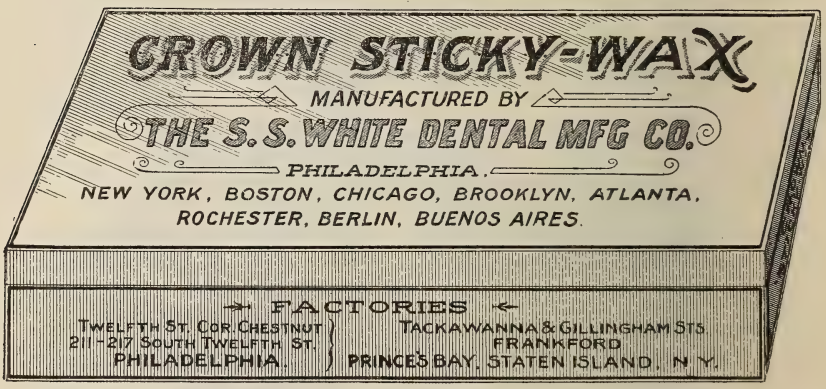
CROWN ARTICULATOR No. 8.



Crown Articulator No. 8 is a modification of Dr. P. G. C. Hunt's well-known pattern to adapt it more particularly for anterior bridge-work. When the model is long enough to take in the natural anterior curve of the jaws, this modified form will accommodate it without having any projection at the ends. It is also well adapted for posterior work. The appliance is neat, and its shape makes it acceptable to the hands in manipulation. Nickel-dipped.

Price..... $0.50

CROWN STICKY WAX.



Size and form of Sticks.

This wax preparation combines, in a superior degree, strength, stickiness, and clean cleavage from the plate or backing. It also has a very sharp fracture, enabling parts to be rejoined with exactness.

Made in round sticks as shown in the cut. Each stick is wrapped in foil, and by removing this only as fast as the Wax is used, there will be no inconvenience in handling it.

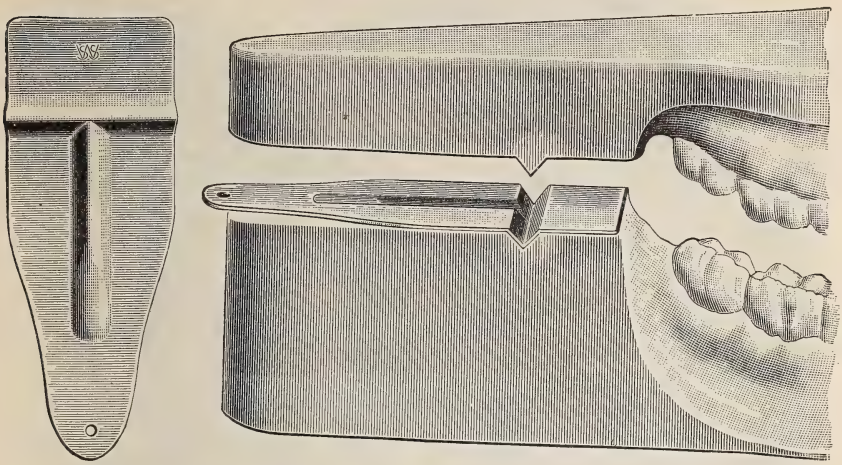
Crown Sticky Wax serves admirably in crown- and bridge-work, and for many other purposes in office and laboratory.

Put up in enameled tin boxes with hinged lid. This lid, when the box is open, serves as a tray to hold the stick which is being used, and which otherwise might get stuck to the table or work-bench.

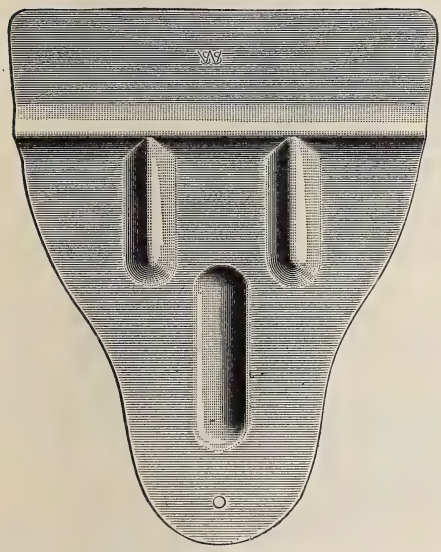
Price.....per box $0.50

ARTICULATING PLATES.

Devised by Dr. Fred. A. Peeso.



No. 1.



No. 2.

We call these "Articulating Plates" for brevity's sake, but they are really fitting plates for articulating or occlusion models. They are of metal, thin, shaped between dies with corrugations to expedite the making of "dowels" or grooves and ridges in the opposing faces of the heel of an articulating model, by molding them in the plaster.

After the plaster for the first half of a model is poured in one side of a "squash" bite, instead of waiting till it sets thoroughly to carve dowels or grooves, an Articulating Plate is slightly imbedded in the surface while still plastic. In three or four minutes the Plate can be removed, the surface of the plaster coated with parting fluid, and the second half run. It is clear that the corrugations made by the Plate in one-half in intaglio will be found in the other half in relief, so that the two cannot help fitting together.

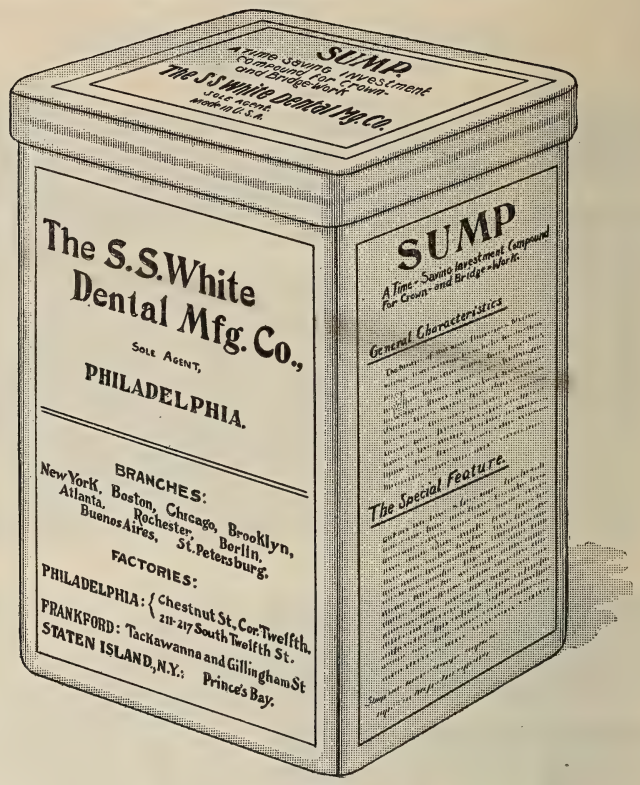
These Articulating Plates do the work quickly and cleanly. If several models are to be run the saving of time will be considerable.

If a piece of plate glass is used to run the model on, the model will always have nicely squared surfaces.

Made in two sizes, No. 1 for crown- and bridge-work and partial cases where the articulation of one side of the jaws only is required; No. 2 for full dentures.

Full directions for use accompany each plate.

Price, No. 1.....each $0.10
" " 2..... " .15


SUMP
A Time-Saving Investment Compound for Crown- and Bridge-Work.
The S.S.White Dental Mfg. Co.
Sole Agent
Made in U.S.A.
The S.S.White Dental Mfg. Co.,
Sole Agent,
PHILADELPHIA.
BRANCHES:
New York, Boston, Chicago, Brooklyn, Atlanta, Rochester, Berlin, Buenos Aires, St. Petersburg.
FACTORIES:
PHILADELPHIA: Chestnut St. Cor. Twelfth, 211-217 South Twelfth St.
FRANKFORD: Tackawanna and Gillingham St
STATEN ISLAND, N.Y.: Prince's Bay.
SUMP
A Time-Saving Investment Compound for Crown- and Bridge-Work.
General Characteristics
The Special Feature.

SUMP.

A Time-Saving Investment Compound for Crown- and Bridge-Work.

General Characteristics.

The feature of this new Investment material which will appeal most strongly to dentists is its saving of time. For the rest, it is at least equal to other well-known investments. That is, it makes a good model, it holds together firmly, it does not crack, it can be built onto with the assurance that the built-up portion will not separate in the firing, it holds the teeth securely and properly protects them, and it is readily removed from the model after the soldering is completed.

The Special Feature.

But in the matter of time it leads them all. In the first place, it mixes quickly. Then, there is no long wait for a Sump Investment to dry out before the soldering can be begun. Instead, almost immediately on the completion of the investment it can be put into the oven or under the blow-pipe and the soldering can go on. This is because, largely, Sump requires so much less water in mixing than other materials used for investments; and also perhaps because it gives up its water more quickly.

These qualities facilitate rapid work, and in the aggregate save the busy dentist valuable time, and time to him, as to others, is money.

Sump is a powder of pale lilac color, which becomes deeper when it is mixed.

Sold in one-quart cans (2¼ lbs.) and in bulk.

Price.....per can $0.75

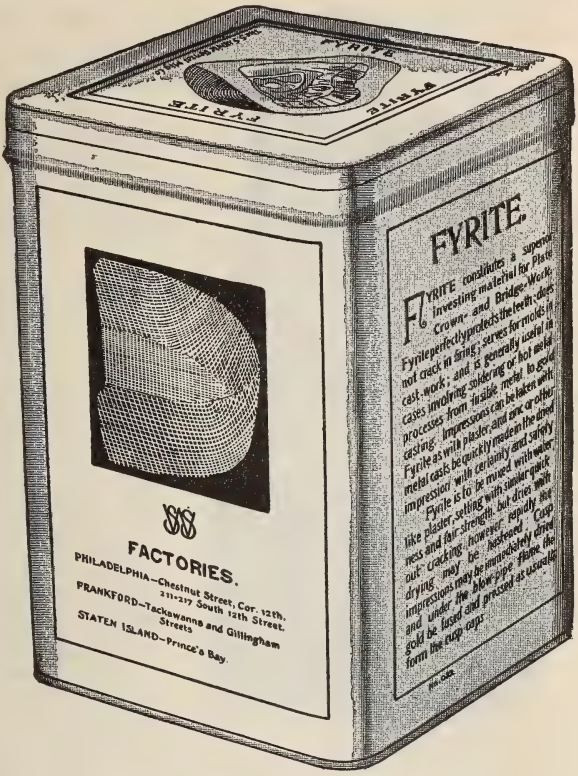
" .....(bulk, 10 lbs. or over) per lb. .25

FYRITE.

Fyrite constitutes a superior investing material for Crown- and Bridge-Work. Fyrite perfectly protects the teeth; does not crack in firing; serves for molds in cast-work; and is generally useful in cases involving soldering or hot metal processes from fusible metal to gold casting. Impressions can be taken with Fyrite as with plaster, and zinc or other metal casts be quickly made in the dried impression with certainty and safety.

For Bridge Impressions add ¼ part plaster.

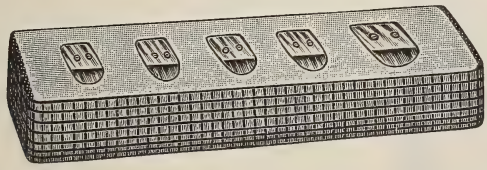
Fyrite is put up only in neat quart cans, as shown in the cut.



Fyrite.....per can $0.25

Wire Gauze for Making Investment Frames

FOR CROWN- AND BRIDGE-WORK.



For single teeth or crown investments, or for backing a set of fronts, or an entire set, one may easily and rapidly shape a parallelogram of gauze, cutting say half-inch long slits near the four corners, and bending the sides and ends to form a box-like frame, into which the thick-mixed batter may be put and the backed teeth be pressed in. Such framed gauze investments may be quickly made, easily handled, immediately dried (for the meshes allow rapid evaporation), while the conductive wire hastens the heating to the soldering temperature.

Price, Gauze in a roll, 24 x 6 inches.....per box $0.30

OFFICE PREPARATION BOTTLES Nos. 4 and 5.

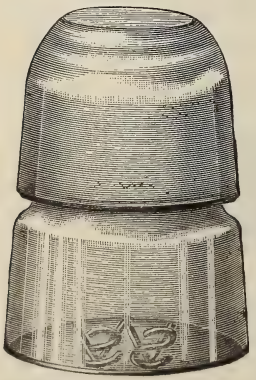
Suggested by Dr. L. C. Ingersoll.

The original design of this Bottle was suggested by Dr. L. C. Ingersoll. As we make it, several improvements are embodied, notably a larger opening and a neater shape. We have also added a little brass shelf in the neck, across the edge of which the brush can be drawn to remove surplus varnish, mucilage, etc., and which also serves for the brush handle to rest against when not in use. This Bottle avoids evaporation and consequent undue thickening of the varnish, collodion, or other contents.

The contacts of the bottle top and its cover are ground, to make a perfect joint. The cover is like an inverted small tumbler.

Used for any preparation requiring a brush. Two sizes, Nos. 4 and 5, the smaller of which is shown exact size. The larger size has a capacity of 6 ounces. Camel's-hair brush included.

PRICES.	Each.	Per dozen.
Bottle No. 4	$0.25	$2.50
" " 5	.35	4.00



OFFICE PREPARATION BOTTLE No. 6.

Of the small conveniences for the dental office none of late years fills a more useful place than this now well-known Bottle. It is the right size for working quantities of perishable preparations, or for those which are used in minute particles, of which a half-ounce forms a full office stock. The ground-glass cover is superior to the usual ground-glass stopper because, while equally efficient in closing the bottle tightly to prevent disintegration or evaporation of its contents, it is more readily removed.

We now supply them in four colors,—Flint, Blue, Green, and Amber. With different medicaments in different colored bottles, a glance shows the one wanted frequently without needing to refer to the labels. For convenience, where a number of these bottles are kept together the labels should be placed on the flat of the cover. The dark colored bottles will also help to preserve preparations which are sensitive to light.

Office Preparation Bottle No. 6 holds about a half-ounce.

Price, either color.....each $0.15; per doz. $1.60

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BOW-SPRING RUBBER.

Trade-Mark Registered June 23, 1874, and July 3, 1894.

To make a vulcanite denture which shall be satisfactory to dentist and patient alike, use Bow-Spring Rubber, take plenty of time in the vulcanizing, and be careful not to run the thermometer up too high.

We know what Bow-Spring Rubber is. It is compounded in our own works. Here are the points of superiority to which its users can testify:

More Para Gum to the Pound than any Other.
Makes a Tougher Plate than any Other.
Can be Vulcanized Thinner than any Other.
Is more Economical than any Other.

PRICES.

Sold in thick (Regular) or thin sheets. Unless otherwise ordered we supply the "Regular" or Thick.

Less than 5 lbs.	per lb.	$2.75
In 5-lb. lots.	"	2.50
In 10-lb. lots.	"	2.25
In 25-lb. lots.	"	2.00

PLASTER KNIFE No. 6.

Designed by PROF. N. S. HOFF, D.D.S.

No. 6.

This Plaster Knife is made of a single piece of steel, and is shown in the cut of full size. The angle of the blade with the handle perfectly adapts it for paring plaster casts either by a draw or push cut.

The sharp chisel at the end of the handle will be found specially useful in chipping off the impression from the cast.

It will be found a convenient instrument in the laboratory for a variety of uses.

Price..... $0.50

DENTAL RUBBERS.

S. S. White's Dental Gum, No. 1 Improved.

Of a somewhat lower grade than Bow-Spring, requiring less care in vulcanizing, but carefully and properly made so as to produce plates of great strength.

Thick or Thin Sheets. We send Thick ("Regular") unless otherwise ordered.

PRICES.

Less than 10-lb. lots	per lb.	$2.25	In 25-lb. lots	per lb.	$1.90
In 10-lb. lots	"	2.00			

The S. S. White Dental Mfg. Co.'s Pink Rubber.

Equal in desirable qualities—color and toughness—to the best of the higher-priced brands. Put up in half-pound boxes.

PRICES.

Less than 5 lbs.	per lb.	$5.00	In 10-lb. lots	per lb.	$4.50
In 5-lb. lots	"	4.75			

The S. S. White Dental Mfg. Co.'s Pink Rubber, "A."

Of a more delicate shade of coloring than the regular Pink.

PRICES.

Less than 5 lbs.	per lb.	$5.00	In 10-lb. lots	per lb.	$4.50
In 5-lb. lots	"	4.75			

The S. S. White Dental Mfg. Co.'s White Rubber.

Price ..... per lb. $4.00

The S. S. White Dental Mfg. Co.'s Black Rubber.

Price ..... per lb. $2.25

Poulson's Pink Rubber.

Price ..... per lb. $5.50

Poulson's Shaded Crown Rubber.

Price ..... ⅕-lb. package $1.00

Poulson's Shaded Jet Black Rubber.

Price ..... ⅕-lb. package $1.00

Poulson's Shaded Pink Rubber.

Price ..... ⅕-lb. package $1.00

Walker's Vulcanizable "Granular-Gum" Facing.

No. 1.	Mottled Granular Gum			per ounce	$1.00
" 2.	Purple Tint Dark Granular Gum			"	1.15
" 2A	" "	Light	" "	"	1.15
" 3.	Florid "	Dark	" "	"	1.15
" 3A	" "	Light	" "	"	1.15

We also sell all other makes of rubbers at manufacturers' prices.

THE S. S. WHITE DENTAL MFG. CO.